# Industrial FINISHING

Reg. U. S. Pat. Office

**Devoted to Product Finishing in the Factory**

Vol. XII, No. 3 | JANUARY, 1936 | $2.00 a Year


## Contents of this Issue


Letters from Readers of "Industrial Finishing" ..... 4

Colors and Finishes for Commercial Trucks ..... 9

Dip Finish Wood Turnings ..... 12

Major Review of Developments During 1935, in New Finishing Materials for Metal, Wood, Paper, Fiber, Leather, Fabrics, Rubber, etc. ..... 19

- Enamels
- Metal Primers; Surfacers
- Metal Finishes
- Metallic Finishes
- Aluminum Finishes
- Rustproof and Anti-Corrosion
- Furniture Finishes
- Wood Finishes
- Paper, Leather, Rubber, Fabric
- Repair Putties
- Solvents
- Miscellaneous

Refrigerator Finishes—III ..... 48

Questions; Answers ..... 54

Editorial ..... 62

Handling Acid with Safety ..... 15

Valentine Co. Transfers McLean to New York Office ..... 16

Finishing Room Fires ..... 46

Chemical Catalog ..... 46

Sixth Packaging Exposition in New York, March 3-6 ..... 53

S. B. Totten Joins Berry Bros. ..... 53

Cudner & O'Connor Co., Chicago, Makes Finishes ..... 61

Taped Paper Cartons Stronger Shipping Containers ..... 61

Berry Brothers Personnel ..... 67

Plaskon Co., Inc., New Name of Toledo Synthetic Products ..... 67

Air Compressors ..... 67

"Classified Advertising" Section ..... 67

Advertisers' Index ..... 68



Published by

**Practical Publications, Inc., 222 East Ohio St., Indianapolis, Indiana**

Eastern Office: C. A. Larson, Mgr., 254 West 31st Street, New York City; Phone, Penna. 6-9049

# Letters from Readers of "Industrial Finishing"

**The names and addresses of firms or individuals whose letters and inquiries appear in this department may be had by writing this office, or letters addressed to them in care of this office will be forwarded promptly.—The Editor.**

## Rubbing, Polishing Machines

In the May 1935 issue of INDUSTRIAL FINISHING, page 33, mention is made of a portable air-driven sander. Will you kindly let me know the name of the manufacturer? I would like to get in touch with manufacturers of rubbing and polishing machines for use on wood burial caskets in both lacquer and varnish finishes.—V. S. H.

## Spray Gun Air Cap

Will you please advise us by return mail where we can purchase the new style air cap which will cut down evaporation—as mentioned in the EDITOR'S NOTE on page 12 of November issue?—T. L. & B. (Furn. Mfrs.).

## Nail Brush Finish

Do you know of some finishing material or process of finishing that will provide a waterproof finish for the wood part of nail brushes? The cost must be low, as the price of these brushes is low, too.

These blocks are made of hard maple, finely sanded, then tumbled. The finishes desired are a full-coat natural glossy finish, and a dull black finish.

The people who make these brushes for us claim there is no waterproof finish in existence that will stand for long on nail brushes, because when the holes for the bristle tufts are bored, the film of finishing coat is necessarily punctured at every hole, thereby allowing water to seep into the holes, which sooner or later (mostly sooner) causes the finishing material to loosen around the holes. After this it does not take long for the finish to deteriorate and flake off. Automatic brush making machines bore the holes and fill them with bristle tufts at one setting, so it is not possible to get finishing material into the holes.

What they use now is one coat of a special clear lacquer that produces a very thin satiny dull natural finish, which does not seem to appeal to the trade as well as full-coated finishes do.—E. M. Co. (Store Equipment).

## How to Use Graining Paper

I would appreciate it very much if you could give me information about transferring mahogany graining paper onto steel furniture. Our trouble is that when we apply water to the transfer paper, it becomes wrinkled and leaves broken cracks and shows the ground where the paper breaks. I might say that the transfer paper has coloring to bring the cabinets to a desired shade.—M. S. R.

## Cleaning Bed Springs

We are interested in obtaining information regarding the best and most practical method of cleaning bed springs prior to finishing. At the present time we are washing them off with naphtha, but if there is another solution to this problem we would certainly like to hear from you regarding same.

At the same time we have the problem regarding the proper method of finishing these springs, wheth-

*A Good Start for the New Year*

# HILO CLIX

## QUICK BAKING SYNTHETIC

**Here is a finish which gives porcelain-like appearance, maximum surface hardness and excellent elasticity.**

**Moreover, Clix bakes in 1 hour at the relatively low temperature of 225°F.**

**It may be applied by brushing, spraying, dipping and tumbling. It covers well in one coat sprayed.**

**Clix adheres well to wood, steel, cast iron, tin, brass, copper, nickel, chromium, zinc, etc.**

**Color card, specimen on wood or metal and liquid sample will be sent on request. If you prefer, we'll finish any specimen you furnish. There's no obligation attached.**

HILO VARNISH CORPORATION

HILO

*70 Years Experience in "Better-The-Finish"*
42-60 Stewart Ave. Brooklyn, N. Y.
Chicago — — Boston — — Philadelphia

*Varnishes Enamels Japans Lacquers*

# You . . .
## can use this PAD OVER material to good advantage!

It's a VARNISH that you simply wipe on with a cloth . . . gloss or dull as you prefer. For either wood or metal. It's resistant to alcohol, hot water, pressmarks, mild acids and alkalies. Sold in pint, quart and gallon cans. Don't delay. Ask us for further particulars!

*Manufactured by*

**H.Behlen & Bro.**

10 Christopher St., New York City

*Hard Wood Finishing Specialties since 1888*

## YOU CAN'T GO WRONG!

Use any Revolite masking tape . . . or all three...with the confidence that they will stick in all weathers, give perfect color separation, cut costs and working time.

**PERMACEL**
Highly-flexible paper masking tape with precision edges for easy, accurate color separation. Weather and lacquer resistant.

**JONFLEX**
Duplicates these qualities in a fine-woven cloth tape.

**INDUSTRIAL**
Differs from Jonflex only in that its cloth backing is heavier, stronger, coarser in texture.

THE REVOLITE CORP.
*A Subsidiary of Johnson & Johnson*
NEW BRUNSWICK, N. J.

Sizes ½" to 36" wide, in 60-yd. rolls. Send for samples.

er or not a spray or dip application is the most practical.—K. M. A. Co. (Furniture).

## To Prevent Enamel From Sticking Permanently

We want to dip and bake an assembled steel product after a number of plated and glass decorations have been attached. Is there a method of treating or coating the glass and plated metal decorations so that after dipping and baking the enamel could be removed from these small decorative attachments by washing in some sort of a solution which would not affect the enamel on the balance of the article?

The attachments are small and irregular, so it would not be possible to cover them with tape, and the cost of the finished product is so low that it would not be feasible to attempt to wipe off the parts individually after dipping. It has, therefore, occurred to us that if there were some substance into which all the small parts could be dipped before the assembly was completed and this substance removed afterward, it would be an answer to the problem which might keep within the permissible cost figures.—D. S. P.

## Who Teaches Furniture Designing?

Will you please refer me to a company or individual that teaches designing for furniture by mail? I am a finisher and would like to take some lessons in connection with my finishing, such as being able to draw up my own suites and decorations. —C. L. B.

## Grain Reproduction

At the present time I am interested in finding out what companies have the equipment or control the process of reproducing the grain of fancy woods, such as stump walnut on a cheaper base. I was formerly in the bedroom furniture manufacturing business and knew of a concern at that time by name of the Oxford Varnish Co. in Chicago, but do not know whether they are still in business or, if so, what their address is. I am very eager on account of designing a line of novelties at the present time on which I would like to include some fancy grained stump or burl modern pieces. I am writing you for the names of these manufacturers or companies who

have this equipment or process, as I know if anyone is posted on this subject, you are.—N. T. R. (Furniture).

## Roller Coating Machine

Some time ago, the writer read an article in your magazine on roller coating finishing, for Venetian blinds. If you know the manufacturer of these roller coating machines, we would appreciate your sending us his name.—C. T. Co. (Mfr. of Finishes).

## Spraying Molten Metal

If possible, kindly advise us where we may obtain information relative to spray equipment for spraying molten metal, using either wire or metal powder.—B. & V. Co. (Fine Industrial Finishes).

EDITOR'S NOTE: Write Metallizing Co. of America, Inc., 44 Whitehall St., New York, N. Y.

## Buffing Waxed Prints

Could you recommend a firm making a device that would buff or polish a very glossy surface on paper photo prints which had first been treated with a coating of wax? The wax we have tried is the regular floor wax, but believe this could also be improved by using the right wax. We should like to feed the pictures into such device and have them come out highly polished and waterproofed.—M. O. Studios (Portraits & Frames).

## Block Cutters

I would appreciate your letting me have a list of "Block Cutters." If you can not supply this, I would appreciate your letting me know just where I can secure this list. — C. Mfg. Co. (Oiled Silk & Oiled Silk Products).

## Wrinkle Finish

One of our customers has asked us to help them locate materials and equipment for producing "wrinkle finish," sometimes known as "textured or shrivel finish." They advise us that while the process is usually applied to metal, it is also applica-

*(Continued on page 64)*


# *Manufacturers of:*

**CLOCKS—ELECTRICAL GOODS — NOVELTIES — TOILET SEATS — TOYS, LAMPS, ETC.**

***Make your Finish Sell your goods!***

● Walker's Metallic Pyroxylin Enamels. For new and different effects. Has unusual "Eye Appeal."

● Produces a beautiful lustrous finish with excellent adhesion and good coverage in one coat. Can be polished or buffed to obtain a higher lustre.

● Furnished in: Gun Metal, Gold, Silver, Bronze, Copper and various pastel shades.

● Has wide use and varied application. Is now being used effectively over a wrinkle finish to enhance its decorative appearance.

***Chart showing full line of colors or a finished sample will be sent on request.***

**H. V. Walker Co.**
ELIZABETH, N. J.

***The Emblem of Standard Quality in Finishes.***

# MORE PROOF . . .

## *DeVILBISS Equipment Spray-Finishes*

## *The* COMPTOMETER

Reg. U. S. Pat. Off.

**Leading manufacturers know that DeVilbiss Equipment produces finishes of higher quality, enhancing the appearance of the product and imparting added selling appeal. They know that it speeds up finishing operations, saving time and labor and reducing production costs . . . Investigate the newest developments in DeVilbiss Spray-Finishing and Exhaust Equipment.**

THE DEVILBISS COMPANY · TOLEDO · OHIO

*New York Philadelphia Cleveland Detroit Chicago St. Louis*
*San Francisco Windsor, Ontario*

*Direct sales and service representatives available everywhere*

DeVilbiss

Spray finishing a masked truck body. Photograph Courtesy of The DeVilbiss Co.

# Colors and Finishes for Commercial Trucks

by Frank P. Connolly
Valentine & Company

**The studied and careful choice of color as an advertising medium and sales assistant for delivery equipment is comparatively recent. Today, color is an all important factor. The tremendous investment in automotive equipment . . . . plus keen merchandising men who know the value of these traveling representatives as goodwill builders, is responsible for the improved appearance of motor trucks.**

IN SELECTING a color scheme for a delivery truck or commercial vehicle, lettering, trademarks, symbols or emblems must be considered. Usually it is desirable to spot-light the company name or emblem. In that case the background color is secondary, soft and subdued. Macy's feature their red star emblem on a quiet field. The Texas Company's white lettering is against fire red. Countless other examples of effective coloring are familiar to you.

Color distribution is second only to color itself. In these days of streamlining, I've often wondered why more firms have not made use of paint as a medium to streamline their fleets. There is no need to change from existing color standards; simply change the arrangement. A line here, a splash of color there, can make a remarkable change. Designers of the Normandie built a

dummy stack to get a play of color and a change of outline.

The type of business is quite often the clue for the color scheme to be used. A dairy, for instance, naturally suggests white or cream yellow; a florist business suggests a bright attractive color scheme with colors matching the freshness of the flowers themselves. An undertaker has little choice. A fire engine almost shouts, "paint me red."

***Color Schemes Identify Company***

The National Biscuit Co. has intelligently selected a biscuit yellow. Department Stores, with the diversified line of articles they merchandise, are of course not influenced by any one product in color selection.

In most cases certain color schemes have long been identified with old established businesses and are as well known as the company name; for example, Armour yellow, Texas red, Marshall Field green, Pure Oil blue, Railway Express red and green, Crane orange, and Sinclair green.

United Parcel Service, who deliver for many types of stores, selected a rich Pullman-car shade of greenish brown, with gold lettering—a color scheme that would not be offensive but one of rare richness which bespeaks quality. You are always on safe ground when you do that.

Anheuser-Busch has capitalized on the advertising value of moving street advertising. Who has not seen the Anheuser-Busch team of giant horses with its sparking equipment, or their cabin cruiser on wheels.

For many years "Lifesavers" has used automobile trucks representing a giant package of their product. Dairies have used trucks the shape of a milk bottle; shoemakers a 15-ft. shoe; and many other businesses have used large scale or truck size reproductions of their product.

Needless to say, the finest color schemes and the best designed vehicles, no matter how well painted, need attention. When equipment is allowed to run down, both in painting and cleaning, drivers become careless in the upkeep of the vehicle and in their personal appearance.

***Keep 'em Clean and Shining***

A short time ago, a New York State baker made this statement: "Very few of our customers ever see the interior of our bakery, therefore it is only natural for them to assume that if our delivery equipment is clean and attractive, the interior of the bakery must be the same. But if our vehicles are shabby looking, marred and dirty, our customers will naturally form the opinion that our bakery is the same."

Modern automotive finishes, which are far more easily kept clean, solve to a great extent the problem of keeping the equipment new looking. The best finish it is possible to produce will become coated and grimy, and will require frequent washing. This cleaning or washing process is different with almost every fleet owner. Some use soap and water; some use polishes; some companies have established regular cleaning times for their vehicles.

The paint and varnish industry has made great strides toward the production of ideal materials for vehicle finishing. In its progress toward this ideal, countless varieties of both natural and synthetic materials have been tested and manipulated in painstaking

research. The result is modern finishes that have twice the life.

A few years ago only natural gums and resins were used in the manufacture of high-grade exterior finishes. The very best of such resins had very little life or resistance in the weather.

Research chemists have been successful in producing synthetic resinous compounds that feature long life in the weather with a high-gloss, hardness, and resistance to abrasion. Newly formulated materials also have the advantage of much greater drying speed than the old types. Today a truck can be painted in about 25% of the time that was required a few years ago.

***The Ideal Truck Finish Maintenance and Cleaning***

An ideal finish should have the following qualities: 1) Long life in the weather; 2) quick drying and speed through the shop; 3) resistance to abrasion; 4) high gloss as applied; 5) spraying ability; 6) brushing ability; 7) retention of gloss in the weather; 8) repolishing ability; 9) refinishing ability.

The fleet owner who spends money in painting his equipment would be foolish indeed if he neglected the proper and careful cleaning of these finishes. If well kept equipment creates a favorable impression, then it is also true that shabby or neglected trucks produce a negative effect.

Men directly in charge of fleet operation, feeling that a moving truck is a moving advertisement for their business, justly claim that a part of the expense of upkeep should be charged against the advertising department. In some business this charge is actually made.

I suggest that truck owners and the finishers and refinishers of commercial vehicles study delivery truck finishes and colors. Do they represent their owners as they should? Would a new color scheme improve them? Would a change in the color distribution help? Would a more favorable and lasting impression be made by changing the position of the lettering or design or emblems? Keep in mind that these remarkably effective moving billboards are more than just symbols of identification.

The selection of colors should not be made haphazardly, for when a color standard is once established it usually remains set.

---

*Note: The above is from an address delivered at the 1935 Mid-year Convention of the National Dry Goods Association, June 12, 1935, Stevens Hotel, Chicago, Ill.*

"Materials for maple or any wood of similar nature are in demand at present. I think there could be a great improvement in sealers and finish coatings, and their application. For porous woods, such as oak and walnut, there is ample room for improvement in fillers, especially where lacquers are used, as from my past experience lifting and blushing are caused more from the filler that is not made especially for it . . . and no doubt this has discouraged a number of those trying to use lacquer."—R. A. L.

# Dip Finish Wood Turnings

## in Four Sections by Four Writers

**Editor's Note: In order to give Industrial Finishing's readers the benefit of different men's experience and viewpoints on the dip finishing of wood turnings and other small wood parts, we referred the first section of this article by Mr. Scribner to three other men having practical information on the subject. Their interesting comments and suggestions are included as Sections II, III, IV. (See paragraph heads).**

■ ■ ■ ■

by C. F. Scribner
Industrial Engineer

THE MERITS of dipping as a means of coating many small articles are obvious, particularly when using lacquer. Dipping in shellac has always been attended with difficulty in securing a smooth finish, while varnish dipping has been generally applicable only to cheap finishes.

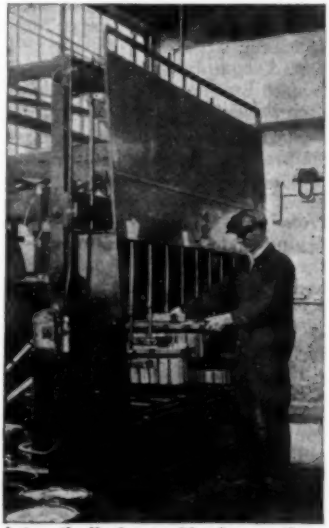
Probably the most common method of dipping in lacquer is known as the "surface-tension" dip, which involves withdrawal at a constant rate from the solution, so that the object leaving the lacquer just "wipes clean." In some cases this work is performed by holding the object stationary and withdrawing the solution at a definite controlled rate. This method has been successful with regular-shaped objects, the rate of withdrawal being very slow to insure a finish free from runs, beads and fatty edges.

Unfortunately this slow withdrawal limits the thickness of the film. In other words, the slower the withdrawal, the thinner the film. Further, the effect of additional coats is difficult to obtain due to the stripping action of each coat on the preceding coat. This stripping effect is both mechanical and chemical in its action. Mechanically, the body of lacquer tends to wipe away the film, while chemically the lacquer and its vapors partially dissolve the film components as they are deposited. For a cheap finish on small regular-shaped objects, the rate of withdrawal of lacquer is effectively carried out by several makes of dipping machines now on the market.

Recently there has been considerable work done in overcoming the failings of the "surface-tension" dip, particularly with a view toward increasing the film thickness of the first coat, and also the finishing of objects irregular in shape. This work has

led to several successful installations where irregular-shaped articles are being finished by a one-coat, lacquer-dipping process. The film produced is not only uniform and free from all defects but, in some cases, it is equivalent in thickness to a 3-coat sprayed work.

Whereas the surface-tension dip depends solely on the skill of the operator or conditions during



**Automatic dipping machine in operation.**

application, vapor-filming permits control and a correction of defects after the application. Furthermore this method also permits control of one of lacquer's most serious problems without the use of expensive air-conditioning apparatus or the introduction of retardents.

This defect is known as "blushing" and refers to whitening of lacquered surfaces in humid weather. Blushing is caused by rapid evaporation of the lacquer solvents, which chills the moisture-laden air surrounding the object. This sudden chilling precipitates some moisture in the air, which reacts with the wet lacquer. The effect of the reaction is to break the colloidal solution and throw out white cellulose nitrate. By controlling the drying process in the vapor-filming method, it is possible to keep the damp air away from the object until it is practically dry.

---

by W. W. Bennett,
Zapon-Brevolite Co.

SEVERAL lacquer and varnish companies make colored dipping lacquers that will leave a heavy coat which, after six to eight hours drying at 80° to 90°F., can be dip-coated over with a clear top coat. The clear top coat is made of certain gums and solvents which are not used in the colored lacquer, therefore it doesn't cut and soften or attack the previously-dipped color coat. These coatings can be applied by hand or machine dipping.

As to the formation of beads or fatty edges after dipping turnings or other small articles in shellac or varnish, this trouble can be eliminated by reversing the up and down position of the dipping parts 10 or 15 seconds after they are withdrawn from the tank of material. In other words, turn them upside down so the small excess material that's starting to form a bead or heavy edge will flow back toward the middle of each turning. As it does so, it will spread and blend into the other material, leveling out smoothly. Of course, the con-

sistency of your material must be just right and the room temperature should be not less than around 70°F.

Most of the dipping lacquers carry "slow" solvents. It depends very much on your solids in dipping lacquers for heavy coats, as they carry from 16% to 36% solids. The greater the solid content in a dipping lacquer, the heavier the film will be after it has dried. These dipping lacquers can be satisfactorily formulated for any company that wishes to use them.

The dipping lacquer and the turnings or other work to be coated, should be the same temperature when they are united. To be sure of this point, I like to have both the lacquer and the products to be coated stored in the same warm room where the dipping is to be done for about 12 hours previous to the dipping operation. Some manufacturers bring the lacquer in from "cold storage" shortly before the work is to begin. You can not expect good work if you do this; and it's just as bad to bring in the parts to be dipped from "cold storage" shortly before operations begin. No dipping lacquer or varnish will work satisfactorily in the face of such conditions.

As for blushing, any kind of blushing in lacquer can be readily overcome by reducing the lacquer with a slow solvent such as amyl-acetate.

---

## by F. H. McLain

McLain Wood Products Corp.

AS TO USING shellac for dipping, I have never had much success dipping shellac, but it is possible to get a very good shellac finish by tumbling or rolling, if the work is properly done with small applications and three or four rollings.

As to dip finishing with varnish, it is possible to dip almost any kind of wood turning with a good varnish and produce a nice smooth finish; in fact, a smooth hardwood turning can be finished by dipping with varnish, and it makes a very beautiful finish . . . much easier to handle than enamel. I refer to the baking varnishes which can be dipped by hand and withdrawn quickly and placed on a drain rack. Varnish is used quite extensively for dipping wood turnings.

Black and colored baking enamels are also used a great deal for dipping; this is usually done by hand, the work being withdrawn from the tank quickly and drained. I have found this is cheaper than to use the lacquers or quick-drying enamels. I consider baking enamels more satisfactory in many respects; they give a more permanent finish, will stand prolonged soaking in water, and will stand a great deal of abuse. These are what are called "oil enamels," and can be thinned with naphtha.

Regarding the quick-drying enamels called lacquers, they are handled more satisfactorily with dipping machines. With a good lacquer I have found no difficulty in putting on a good coat if the articles are withdrawn just fast enough so that the last drop, as the work leaves the tank, is wiped off and the material does not sag any more. A fairly heavy coat can be put on with two or three dips. Each coat should dry perfectly hard before the next one is put on, so as not to start the undercoat running. There are all

kinds of dipping machines and some of these are fairly rapid.

Lacquers used in humid weather should have some retardent material added to prevent too quick drying which cause blushing. Of course, this slows up the dipping machine somewhat, but in ordinary weather there is very little trouble in this respect if the proper lacquer is used. There are all kinds of lacquers on the market—some good and some bad.

After all, dipping with any material is more a matter of experience and good judgment, providing, of course, the material is all right. No two persons will get just the same results when using the same equipment, any more than two women will get exactly the same results making biscuits with the same flour.

by C. W. Smith
Dipping & Enameling Machinery

THE IMPROVED dipping machine finishes all kinds of wood handles, wire, flat metal and cast iron items; and this work, in a great many instances, is finished with one coat of good enamel. Wood handles are usually finished with two light coats of enamel at the rate of from 20,000 to 30,000 per day with one machine in the 2-coat work.

Everything pertaining to the dipping and enameling of thousands of kinds of parts are taken care of by the manufacturer of this improved dipping machine, which is now in use all over the world, and has been for more than a quarter of a century.

## Handling Acid with Safety

TEN-GALLON carboys of hydrochloric, nitric and sulphuric acid have always been dangerous to handle. In the Westinghouse Lamp Co., Bloomfield, N. J., only one serious injury has resulted from acid burns, but the potential danger is always great enough to warrant rigid safety measures. A new method of ejecting small quantities of acid from carboys has been adopted and is expected to minimize the risk in this work.

Acid was formerly ejected by applying air pressure of a few pounds to the carboy, forcing a flow of acid into filter flasks. The likelihood of breaking the carboy seemed remote indeed, but one eventually did break the carboy with serious consequences to the worker. Further danger was also involved when tilting a full carboy to empty it into an acid vat at one operation. Splashing acid always presents a hazard.

"We have so many varieties of finishes in the leather business that it is just impossible to hold to any one formula or method. Nitrocellulose or pyroxylin finishes have increased in the last few years, but there is still room for improvements. If we could get a finish with a dye effect that could be guaranteed against cracking and fading, it would improve the appearance and sales of our products. The only way to lower the cost is to lower the cost of the finishing materials."—F. G. L.

Now a simple suction device is employed to draw small quantities of acid from a carboy for use in processing lamp filaments. A filter flask is plugged with a rubber

**Fig. 1—Ejector device draws acid from carboy by suction and minimizes danger of burns.**

cork and two glass tubes, as shown in Fig. 1. One tube drops down into the carboy; the other is connected to a rubber suction hose. Air is withdrawn from the flask, creating a suction which draws acid up from the carboy.

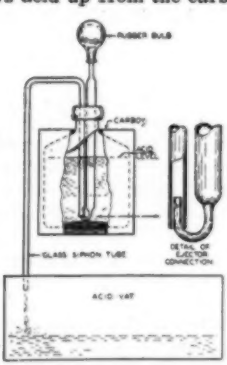



**Fig. 2—Safety method of emptying full carboys at one operation without danger of burns from splashing acid which sometimes occurs from the manual tilting operation.**

An interesting feature of this ejector device is the method of creating the suction. The rubber hose is attached to the suction side of a laboratory water filter. As air is released from the pressure line through the nozzle of the water filter, it creates a suction in the hose, which, though slight, is sufficient to create enough vacuum in the filter flask to draw acid from the carboy.

A different siphoning arrangement is employed to empty a full carboy into an acid vat at one operation. The carboy bottle is plugged with a cork and two glass tubes, both of which extend to the bottom of the carboy and both of which will fill with acid to the level inside, see Fig. 2. One tube is a siphon that runs out, over, and down into the vat below. The other tube parallels the first one and connects with it at the bottom of the bottle. Outside it is topped by a rubber bulb.

Pressing the rubber bulb forces acid up into the siphon tube until it spills over and starts a flow down into the vat below. As the carboy can be emptied easily and safely by this method, danger of acid burns from splashing is practically eliminated.

---

## Valentine Co. Transfers McLean to New York Office

Effective January 1, 1938, Mr. A. W. McLean will be located as manager of industrial sales in the New York head office of Valentine & Co. For the past two years, Mr. McLean held the position of industrial sales manager of Valentine's New England branch, and prior to this was connected with Lilly Varnish Co. of Indianapolis and the Arco Co. of Cleveland.

Mr. W. R. Poole is appointed field manager, effective January 1, 1938, and will also be located in Valentine Co's. New York office. Mr. Poole was formerly Valentine's trade sales manager in the southern territory.

## Major Review of Developments During 1935, in

# New Finishing Materials

### For Metal, Wood, Paper, Fiber, Leather, Fabrics, Rubber, Etc.

FINISHING materials and processes that represent strictly new developments during the past year, as well as numerous improvements reviewed here previously, are included among the latest offerings to the industrial finishing trade. There is a material especially suited to practically every purpose or requirement. Not only this, but many of the new materials are designed to perform unusually difficult jobs better and at lower production costs. It is important, therefore, for every user of finishing materials to look over this Review carefully for certain obvious opportunities to improve the quality of his finishes, and to save labor, time and cost in his present or contemplated finishing schedules. Additional information is available about each of the items presented in these brief paragraphs. You are invited to write INDUSTRIAL FINISHING for further data about any of the materials that interest you.

• More than 120 new and improved materials are listed in this special Review of Developments During 1935 under the following 12 classifications:


Enamels.....Start on page 19
Metal Primers; Surfacers..... 21
Metal Finishes ..... 22
Metallic Finishes ..... 24
Aluminum Finishes ..... 24
Rustproof and Anti-Corrosion..... 26
Furniture Finishes ..... 27
Wood Finishes ..... 29
Paper, Leather, Rubber, Fabric..... 30
Repair Putties ..... 32
Solvents ..... 37
Miscellaneous ..... 38


■ ■ ■ ■

### Enamels: White, Color, Black

These include air-drying and baking enamels for wood, metal and other materials; refrigerator whites; non-poisonous, one-coat toy enamels in bright colors; synthetic enamels that are alkali resistant; jet blacks; and polychromatic finishes for producing an economical lustrous one-coat refinishing job on automobiles.

**Industrial Valenite**—A line of synthetic air-dry and bake enamels which give excellent adhesion, coverage and mar-proof qualities when applied either by the dip, spray or tumble method; one coat . . . . outstanding in quality.

**B. F. P. Synthetic Enamel**—An alkali-resistant synthetic-resin enamel that dries with the speed of lacquer; highly resistant to alkali; ideal finish for laundry equipment

and metal specialties that come in contact with caustic solutions and other corrosive agents; can be furnished in most colors; is to be applied by spraying.

**Synthetic White Baking Enamel**—A non-yellowing synthetic which covers perfectly in one coat on bare metal. When baked at 250°F. for two hours it produces a film that is exceptionally hard and extremely elastic; will not yellow when baked at this heat; dries with a high luster. Also made to air dry if desired.

**Refrigerator White, Synthetic**—Outstanding in appearance and durability. A 2-coat finish, whereas most of the finishes in the past have been three coats for this type of work. Has unusual hiding power, as well as baking out at a lower temperature than most competing materials.

**Toy Enamels, One Coat for Metal or Wood**—Typical Valspar quality materials combining quick-drying, one-coat coverage; unusually bright and attractive colors; very economical.

**Non-Poisonous Color Enamel**—A one-coat, non-poisonous color enamel that is fadeproof and stainproof, and which dries in 30 minutes. Reduction may be made, according to the covering desired, by the addition of 15% to 25% of regular naphtha or mineral spirits. No special thinners are necessary; made to spray or dip; works best on wood surfaces. For one-coat work on cheap pieces, it can be sprayed on bare wood. For quality work it should be applied over a sealer or undercoat; is fadeproof and waterproof. Dries to handle in 30 minutes and ready to ship in four hours.

**Non-Poisonous Toy Enamels**—Developed to fill the demand for low-priced economical materials to give a one-coat finish that will stand out, even when applied to bare wood. The items include:

1) Bright air-dry toy enamels for wood.

2) Bright air-dry and bake toy enamels for metal.

3) Bright lacquer enamels for wood and metal.

4) Clear gloss and flat varnishes.

5) Gloss and flat lacquers.

These products have excellent gloss, opacity, and are economical. The enamels and varnishes set up to handle in one hour, and dry thoroughly hard overnight. Particular emphasis is placed on one of the outstanding virtues of these toy enamels—they are non-poisonous.

**Ditzco Polychromatic Enamels**—For automotive refinishers. Quick set enamels having deep rich luster without primer, rubbing or polishing. Apply over old finish. Dust free in 15 minutes; ready to handle in four or five hours. These materials are synthetic enamels of the alkyd type carrying a small amount of finely divided metallic particles that are incorporated into the vehicle through a special process.

**No. 311 Gloss Jet-Black Enamel**—For use on either metal, composition, or wood; gives excellent adhesion and durability; may be air-dried or baked . . . may be sprayed, dipped or tumbled.

**Permaglo (Air-dry and Bake Finishes):** Fulfills over the maximum period of time, and despite severe destructive influences, the primary function expected of a finish, namely, to constantly present gleaming and beautiful appearance. The apex of the Permaglo group is Permaglo Refrigerator White, which not only produces unmatched initial gloss, depth and whiteness, but maintains these qualities unchanged under exposure to moisture, grease, sunlight, severe heat and cold, soapy washes, fruit juices, flavoring extracts . . . Permaglo is available in high bake, low bake, and air-drying types, and in all colors. Primarily a metal finish developed to meet the complete range of metal finishing requirements, from one-coat direct-to-metal systems to the more elaborate schedule of prime coat, sanding surfacer, and finish.

## Metal Primers; Surfacers

Here are important base coatings for various metal surfaces including terne-coated sheet steel, zinc, die castings, and chromium-plating. All of these primers have excellent adhesion to bare metal. Some are played up for their flexibility and toughness, some for their rustproofness and corrosion-resistant qualities, and others for such merits as quick-drying, easy sanding, and excellent bonding between the primer and succeeding coats.

**Lithoform** — Makes paint stick to galvanized iron and galvanneal. Surfaces treated with this new chemical will take paint perfectly. The coating provided by lithoform will not wash off, nor chip, nor corrode in the weather, and it is not affected by baking temperatures. Can be brushed or sprayed.

**Berryloid Zinc Chromate Primer**—A quick-drying, corrosion-proof metal primer for automobile refinishing jobs where the prevention of rust or corrosion is important. Meets U. S. Navy specifications for a corrosion-inhibiting primer for the metal surfaces of naval aircraft; adheres firmly to any metal surface, whether highly polished or rough, whether of dural, aluminum, steel or cadmium plated. Its corrosion-inhibiting qualities are due chiefly to the nature of the pigment (finely ground zinc chromate) which is carried in a vehicle consisting chiefly of synthetic resins.

**Primer for Terne-Coated Sheet Steel, Zinc and Die Castings:** Has excellent long-time adhesion, flexibility and toughness. Air dries for recoating in 30 to 60 minutes, or can be baked at 150° to 300°F. for 15 to 45 minutes. Doesn't become brittle. Should be reduced with coal-tar solvent in ratio of three parts primer to one to two parts of solvent, depending upon nature of work and other conditions. Can be brushed or sprayed.

**Preparakote**—A new primer for automotive refinishing. Forms an adhesive bond between the surface and the succeeding coat; also serves as a filler. Can be dry-sanded in four hours after application.

**Valdura Enamelized Metal Primer**—For prime coating all metal surfaces where extremely damp, wet, and foggy conditions are prevalent. Its high protective qualities are the result of combining zinc chromate pigment (one of the best rust inhibitives known with tung oil which is . . . "the best waterproofing oil of vegetable origin known to technical science." This new primer applies with a brush and dries in from six to eight hours. Coverage up to 500-sq.ft. per gallon is claimed.

**Clear Chromium Primer No. 6044**—A clear lacquer-base material formulated especially for use over chromium plated parts as a primer. Has remarkable adhesion, flexibility and toughness of film. Is adjusted ready for spray application. Should be sprayed in a thin even coat over

properly cleaned surfaces. If desired, it may be baked for 15 minutes at 150° F. to quicken drying. Also used as a finishing top coat directly over chromium.

**Filloid, Non-Absorbent Surfacer**—Air dries hard in 2½ to 3 hours and fills quickly with a minimum of coats because of its high solid content and smooth flow. Was discovered by technical director of manufacturer on a recent visit abroad. Filloid cuts down easily to a hard smooth surface by dry or wet sanding. Its non-absorbent characteristic eliminates the use of a sealing coat; does not lift, bridge or shrink under top coats, whether of the lacquer, oil-base or synthetic types. In applying it by knifing or glazing, Filloid is free from that "pulling" tendency. For use on auto bodies, including trucks and busses, also railway work and machinery castings. . . .

> "Sanding and rubbing are expensive. The appearance of our articles is quite satisfactory, but our rubbing operations are too high to suit me." — Supt. (Band Instruments).

## Metal Finishes

The new developments in metal finishes include air-drying and bake finishes in smooth and textured coatings, in blacks and colors. Outstanding features include excellent adhesion, toughness, hardness, flexibility, luster, and resistance to various elements that tend to break down or discredit the finish.

**Arcozon Fixture Finish, High Gloss**—A one-coat, high solids, synthetic lacquer for spraying electrical fixtures and many similar metal parts. Dries hard to a tough film without becoming brittle. Excellent adhesion, high gloss, print-proof.

**Arcozon Flexo**—A one-coat spray lacquer for use over metal parts, stampings, nameplates, etc. Possesses unusual flexibility, adhesion, hardness and luster. Retains these properties over a long period of time. Heavy and lighter gauge metal sprayed with Flexo may be stamped, formed, cut and blanked without danger of cracking, shearing, or loss of adhesion.

**Benton Gray**—A new air-dry finish for metal. Through its peculiar metallic color it tends to hide slight imperfections on some metal surfaces. One coat on the bare metal (no primer required) gives a tough, flexible finish that doesn't crack or peel under even the most severe abuses.

**Tonetex Wrinkle Finish**—A beautiful, uniform-texture finish for metal, in black and colors. Articles finished with Tonetex can be put in the oven at once, or may air-dry for hours without affecting the uniform wrinkle of the finish. Easy to apply. Speeds up production. Can be handled and wrapped for shipment a few minutes after it leaves the oven. A synthetic wrinkle finish "that's different." Will bake at 225° F. for one hour for the lighter colors. Black Tonetex will bake at 300°F. for one hour. The longer baking increases its resistance to acids, alkalis and heat.

**Metal Radio-Tube Coating**—Developed especially for the new metal radio tubes which are made of steel and coated with a new type of black lacquer. An air-drying dull black lacquer for spraying. One unusual demand is that the coating must not smoke or give off any odor when a tube is in operation. The operating temperature of many types of tubes is about 350°F. In addition, the coating must have unusual hardness, adhesion and good resistance to rusting, even after long and intermittent heating. This lacquer is

ideally suited for numerous other products where genuine quality and economy are requisites.

**Synpex Undercoats for Grained Metal**—Air-drying undercoats for manufacturers of metal furniture. To use, apply one spray coat of Synpex undercoat of the color desired, thinned equal parts with thinner. Air-dry about 15 minutes, and then apply the graining. Bake for one hour at 250° to 300°F., or follow same schedule as used in baking graining ink. Synpex undercoats are a combination synthetic and lacquer material; retain their elasticity under heat for a long period of time. Using these materials, you eliminate one baking operation and get a clean finished job, as the Synpex air-dries dust free in the same time as ordinary lacquer.

**Ruf Kast Finish**—Now adjusted so the pattern will form in the air and then be baked, which permits of more flexibility in the manufacturing program.

**Chrome Plate Coating**—For use directly over chrome and other plated surfaces. Possesses unusual adherence; may be air-dried or baked; covers solidly in one coat. Practically any color can be made in this type of material.

**Clix Finishes**—Bake finishes in red, yellow, blue, green and gray; 100% synthetic-resin products; dry to hard, tough and glossy films, and have a porcelain-like appearance. Colors retain their shade to a remarkable degree both with age and under heat. This finish is very elastic and toughens with age without getting brittle. Has satisfactory water resistance for most purposes; this is improved by longer baking. Can be readily applied by spraying, dipping or brushing. By reducing with special thinner, excellent coating machine results may be produced. The colors will bake to a satisfactory hard finish at 225°F. for one hour; longer baking will improve hardness, toughness and durability. There is no need for baking longer than two hours. The clear is often used as a finishing coat over colored oil enamels to give hardness. Clix will not air-dry.

**Banbo Black (for Metal)**—A non-bleeding, low-viscosity liquid black which air-dries dust free and tack free in from three to five minutes, yielding a rich black, semi-gloss finish. Has exceptional covering capacity, a single pass of the spray gun being sufficient for complete coverage. One gallon of Banbo Black adequately covers over 550-sq.ft. of a bright, shiny surface; the residual film deposited by one spray coat is approximately two to three times as thick as a regular lacquer material. No danger whatever from runs or sags on vertical surfaces, even under the most severe production speeds and handling.

**Banbo Colors**—Exhibit the same characteristics and properties as Banbo Black, except that these colors take a 33 1/3% reduction with toluol or similar coal-tar solvents.

**Jetal Process (Chemical Black)**—A chemical process of coloring all grades of common iron or steel a uniform brilliant jet black by simple immersion in an aqueous bath of comparatively low temperature for about five minutes. No plating,

spraying or baking required. The finish becomes a part of the metal itself and hardens the surface; cannot chip, scale, peel or discolor. Sheet steel can be stamped and shaped after the finish is applied without impairing the black surface. Forms an excellent bond for any subsequent coating such as lacquer, varnish or enamel. Can be applied to polished surfaces without dulling luster.

## Metallic Finishes

As the name implies, these are finishes that look like some metal after they have been applied to a surface. They include copper, bronze, silver, and gold for durable decorative finishing. All contain fine metallic pigment. Many of these materials are used for finishing or decorating novelties and specialties.

**"Copper Paint"** — Discovery of a chemical process whereby 98.3% pure copper is prepared in a form suitable to application in a liquid carrier, makes this paint possible. Elemental copper is broken down into a finely powdered non-crystalline form which, when mixed with a special vehicle, yields a material not unlike liquid copper; may be sprayed, dipped or brushed.

**Burnished Finish**—The smooth, lustrous, hand-tooled burnished metallic finish, so often used as a decorative trimming on expensive picture frames, can be produced with a sprayed finish in silver, gold, bronze, copper and other attractive colors. Can be applied satisfactorily on wood, metal, composition board, glass and clay products at reasonably low cost, and by modern production methods; is beautiful, durable and easy to apply.

**Hammered Silver, Specialty Finish**—Reproduces a unique hammered silver effect on metal with one coat application. Dries free in about 15 minutes, and hard to the nail overnight. Especially adaptable for badly scored and pitted surfaces such as castings, forgings, etc., or may be applied to smooth surfaces.

**Puritan Goldichrome**—By means of skillful blending of alloys this Goldichrome tone bronze powder was developed. Manufactured in two standards — Finest and Smooth. Finest Goldichrome powders produce an effect similar to plating. Smooth Goldichrome powders produce a smooth satin brushed effect. They may be dipped, sprayed or brushed in lacquer or with varnish bronzing liquids. These powders have unusual durability and decorative value.

**Clear Bronzing Lacquer No. 6397**— Doesn't jell or turn bronze powders green for several days after being mixed with the powder. Requires thinning with lacquer thinner in equal parts for spray application . . . . excellent adhesion and toughness of film.

## Aluminum Finishes

Finishes containing aluminum are available in considerable variety for both protective and decorative purposes. Some of these are designed especially to serve as durable coatings on surfaces subjected to high temperatures, for example, boiler fronts, heaters, etc. The particular merits of others are their flexibility, toughness and resistance to acid and alkali solutions. All are characterized by their excellent adhesion to metal — no cracking, flaking, peeling or dusting.

**Dipping Aluminum**—An exceptional baking aluminum for metal parts, to produce a uniform lustrous finish over smooth, uneven and curved surfaces. Has excellent flow. Is stable in the dipping tank. Tests over a 4-month period show no flocculation of the aluminum. Especially adapted for beds, toys, springs, wringers, novelties, etc.

**Heat-Proof Aluminum**—For use on surfaces subjected to extremely high

heats. Can be applied while the surface is hot, and will stand cherry red heat without discoloration of the aluminum, or cracking or peeling of the film.

**Dipping and Baking Aluminum Vehicle**—Used by some large toy manufacturers. An extremely bright, smooth, free-flowing finish. The vehicle is known as SO-177-A Special Dipping Aluminum Vehicle, and seems to give surprisingly satisfactory results. The mixture that is used is 1½-lbs. of paste aluminum to a gallon of vehicle and a half-gallon of special thinner. The pieces to be finished are dipped and allowed to drain for six or seven minutes; then they are baked in an oven at 250°F. for 20 minutes. This particular vehicle holds its leaf and does not break down in four or five weeks of standing; and after it does break down it can be brought back by the addition of an equal amount of freshly mixed paint.

**Aluminum Paint No. 2301**—A heat-resistant aluminum paint and aluminum vehicle particularly adapted to any surface subjected to intense heat, for example, boiler fronts, heaters. . . . A metal coated with this aluminum paint can be heated to a cherry red and, when cold or cooled, the aluminum is still intact on the metal, affording a perfect film. Also highly resistant to acid and alkali solutions.

**Silver Gray Synchrome Lacquer**—An aluminum lacquer enamel in which the metallic pigment is so finely dispersed that when it is sprayed it produces a finish very closely approaching a plated effect. This unusual dispersion assures stability in the container, freedom from settling, and a saving in materials . . . . Lends itself admirably to the production of the popular luminescent colored lacquer enamels. When 4 to 8-oz. of Synchrome are added to a gallon of colored lacquer enamel, a very smooth, bright, pleasing finish is obtained. Has excellent adhesion to properly cleaned metal, requires no primer, and produces a very tough and mar-proof finish.

**Velvet Aluminum Lacquer No. 1986**—An extremely finely-ground aluminum lacquer for spray application, requiring thinning with lacquer thinner. For metal or wood, for exterior or interior use. Excellent coverage in one coat; dries rapidly; excellent adhesion direct to metal; extremely durable. If greater adhesion and toughness of film are desired on metal, it may be force dried at 300° to 400°F. for five to ten minutes. Baking increases its adhesion and toughness to the extent that a finished panel may be hammered and twisted or bent without loosening or showing any signs of breaking away from the metal. Withstands severe humidity tests.

**M. D. Luminous Paste**—Resembles white lead, but it is aluminum metal in an extremely fine state of division. Thoroughly wet and uniformly dispersed in a petroleum product. Used in the same manner as aluminum powder, it does not fly around; forms a continuous opaque film; produces a smooth finish; has extreme brilliancy and durability. Mix 8-oz. of paste to the gallon of thinned lacquer. Paste should be combined with the thinner first and then the thinner paste mixture added to the lacquer.

Grades of this luminous paste are available for use with lacquer and with long-oil spar varnish.

"We would like to read a discussion on the dipping of synthetic enamels and wrinkle finishes. With the increased cost of these materials, we could make a substantial saving if some of the paint people would develop these finishes to be dipped."—W. F. & E. Co.

## Rustproof; Anti-Corrosion

**Here's something for which there is always a demand by both manufacturers and users of metal products. From the variety of materials and treatments presented in this group, there is undoubtedly one or more that will meet any conditions or requirements demanded.**

**Red Oxide Primer 2-A-352** — Has extremely high rust resistance; air-dries in about one hour, or may be baked for ½ hour at 175°F.; is particularly suited for rush production schedules, or in those plants where space is at a premium . . . . May be applied on metal castings which then may be placed in the yard for several months until the time for final finishing.

**Anti-Corrosive Enamels** — For the protection of metal against corrosion; give maximum protection against corrosive action of humidity, salt water, alkali, miscellaneous chemical corrosive influences, and will prevent electrolytic action. Are made from rust-inhibiting pigments and a synthetic resin vehicle. Will air dry to handle in four hours, and hard overnight. For maximum protection two coats of the material are recommended. Can be brushed, sprayed or dipped. Can be thinned approximately 10% for brushing and 20% for spraying. Will cover approximately 350-sq.ft. per thinned gallon. Made only in brown, black and red.

**Mogul 3-Way Coating** — A transparent, gelatinous fluid the consistency of paint . . . . durable and elastic, and can be used as a primer or finishing coat on any metal surface, whether new or heavily rusted. Can be used in three different ways: 1) as a rust preventative over unpainted or newly finished metal; 2) as a primer, with the advantage that the elimination of rust accumulation will give permanency to the overlying paint application; 3) for applying over rust, with the elimination of sanding, scraping, sandblasting . . . . making the rust absolutely inert and therefore not causing the paint application to peel, crack or raise. Can be brushed or sprayed on any metal surface the same as paint . . . . is very elastic.

**"Impervious Films"** — Coatings which form films that are free from porosity and impervious to water and corrosive atmospheric gases. The vehicle is a combination of pure vegetable gums and heat-treated oils. Forms films which are strictly airtight and water-tight, elastic and will not peel, chip, nor crack. For this reason they rank high in protective value and in preventing corrosion of metals. They are applicable also to wood and to other surfaces such as dry concrete and plaster. Resistance to salt and fresh water and to all degrees of humidity, as well as to extremes of temperature is unusual. Primers with the new non-porous base are available for various purposes. Brush, spray or dip after thinning with pure turpentine or high-grade mineral spirits.

**Cromodizing Rustproof** — A rust-proofing treatment adaptable to many steel products, particularly

those made of sheet stock which has been pressed into shape. In this process, steel products are dipped in or sprayed with a solution of cromodine, a proprietary chemical, for one minute. Following this treatment, which changes the surface of the steel so that it no longer has the power to rust, the work is rinsed, dried, and painted as desired. Cromodized steel is smooth and perfectly paint receptive. Finishes applied over it exhibit a splendid luster . . . . Excellent adhesion of paint to cromodized steel; finish is not broken when metal is bent or distorted.

**Electro-granodizing**—In this process, steel parts are continuously coated with a layer of phosphates by alternating current electrolysis. In reality, the current really first coats the steel with a layer of metallic zinc, and then converts the zinc to a paint receptive phosphate. Electro-granodized surfaces are provided with the best rustproof and paint receptive coating that has yet been applied directly to steel. In addition, the electro-granode coating will resist rust even when unpainted and therefore is especially valuable to those who wish to store the unpainted parts for a period of time before painting, or who find it most convenient to fabricate the parts in one plant and then ship to another for assembling and painting. In cost, Electro-granodizing is substantially below that of the commercial phosphate methods.

## Furniture Finishes

In this group we find materials that finishers of furniture, fixtures and fine cabinet work appreciate so highly, because they can easily produce rich, natural-tone finishes on all kinds of wood surfaces at lower costs in labor and material. Permanent uniforming stains, wood bleaches, wiping glazes, sealers, shading lacquers, flat varnishes and alcohol-proof finishes are among the outstanding numbers. Here, especially, the Editor regrets the lack of space which is really needed to give more of the essential facts about all of these new and valuable developments that are to mean so much to the furniture industry.

> **"The refinement of clear finishing lacquers would greatly reduce the rubbing and polishing cost. Also, we would welcome a finer primer-surfacer that would cut the cost of sanding." —C. E. M. (Casket Finishing).**

**C & O Uniforming Oil Stain**—In walnut and dark brown mahogany; has depth of color, richness and easy working qualities. Pigment color remains in suspension; sets quickly, wipes easily. Can be coated with sealer in four hours. Can be dipped, brushed or sprayed.

**Permanent Pigment Oil Stains**—Produce a finish permanent in color; do not hide the grain of the wood, nor raise the grain, therefore they save a sanding operation. Are as non-fading and as permanent as water stains. Eliminate wash coating of shellac, as filler can be applied directly over the stain. Uniform sap woods and all variation in color of wood.

**L-Mac-E Nu-Tipe Uniforming Oil Stains**—Produce remarkable uniformity, practically eliminating all need for the shading usually necessary to obtain uniform colors over all, especially when woods of different kinds or colors are used in a single piece or suite of furniture. Excellent for keeping the leg turnings on tables and case goods of even and light uniform color.

When walnut is combined with

non-porous woods it may be filled in the usual manner. These stains are generally as fast to light as water stains and in many cases have even greater permanency. Produce an excellent foundation coat for the finishing applications, because they tightly seal the fibrous parts of even the most porous woods. They flow out to a full and even bodied finish, drying quickly with a hard surface that can be coated over with sealer and lacquer or shellac and varnish, with unusual adhesion. These stains remain in suspension without settling hard. They require only ordinary care in stirring. Available in four different types—Dipping & Wiping; Dipping & Non-wiping; Brushing or Spraying & Wiping; and Brushing or Spraying & Non-wiping.

**Shellac Mixing, No. 448**—Manufacturer reports improved body and sealing power without impairing in any way its waterproofing and marproofing qualities.

**Equi-Tone Shading Lacquer**—Prepared through a special process which disperses the pigment so finely that the resulting solution is not only perfectly assimilated, but remains uniform throughout, even when stored in bulk. No aniline color of any kind is used, therefore Equi-Tone Shading Lacquer is positively fast to light, non-fading and non-bleeding. Assures a clear transparent and rich tone; perfect adhesion to undercoats of sealer or shellac and mixing lacquer. Comes in the exact color required for each particular specification, and should not be reduced to lighter shades. Dries instantly and all lacquer coats may be applied over it immediately after application.

A striping lacquer in white or light shades can be applied directly over the shading lacquer if desired, and there will not be the slightest tendency to bleed through.

**Super Wood Bleach**—A two application bleaching process—Bleaching First-Coat Solution with Bleaching Second-Coat Solution. A pronounced step forward for effectively bleaching all woods. Invaluable in the production of the new finishes, Pickle Pine, Pickle Mahogany, and Pickle Maple; also in the reproduction of European finishes featuring the mellow antique tones, so much in vogue at this time. . . .

**Crystalac**—An extremely fast-drying sealer to be used as the substitute for shellac in finishing furniture. This is a very smooth, sanding sealer for use under clear and colored varnish.

**Pigment Glazing Colors**—Improved during 1935 and brought to a high degree of perfection; for use in pro-

SINCE 1875
**STAINS**
**ALL KINDS**
**Henry A. Dewey Co., Inc.**
391-403 Concord Ave., New York City

**SUPERB ALUMINUM FINISHES**
AVAILABLE FOR IMMEDIATE DELIVERY ANY SPECIAL TYPE ALUMINUM POWDER OR PASTE INCLUDING LININGS FOR MANUFACTURERS OF AIRCRAFT—CASKETS—COATED TIN, ETC.
For those who prefer Paste Aluminum, U. S. offers . . . . . THE ORIGINAL **M-D-LUMINUS PASTE**
*(Trade Mark Registered)*
Warehouse Stocks at All Strategic Points. Address Dept. H for complete details.
UNITED STATES BRONZE POWDER WORKS, INC.
220 WEST 42ND STREET NEW YORK CITY

ducing the artistic antique effects demanded in reproductions of Old World finishes and for modern creations on mahogany, walnut, satinwood, and other fancy woods, as well as on painted and decorated furniture.

**Tru-Tone Wiping Glaze**—For producing the soft, blended antique effect which adds to the attractiveness of many finishes . . . . wipes clean, is free from muddy appearance, and it does not settle hard in the container. Stays open long enough for most wiping and may be cleaned up with a benzine rag. All popular shades. . . . Delatone, which produces a mellow brown in a rich tone; Bone White, nearly black without being muddy; Old World, a dark rich shade and wipes cleanly; Old Ivory, a medium brown for warm antique effects; Fruitwood, a light brown suitable also for use on maple. . . . Tru-Tone Wiping Glaze may be coated with lacquer within two hours.

**Furniture Lacquers**—Clear sealers, clear gloss and clear flats of dependable quality; their build, durability and rubbing qualities are excellent.

**Dinette & Breakfast Suite Finishes**—One-coat, transparent colored finishes for oak dinettes and breakfast sets. High gloss and rich colors. Quick-drying lacquers that give the efficiency of colored filler and clear lacquer over sealer.

**Q. D. Synthetic Flat Varnish**—A quick-drying, synthetic, flat varnish. The principal objections to ordinary flat varnishes — tenderness and scratching white — have been completely eliminated in this product which is as economical to use as the regular run of flat varnishes.

**Mod Var Bar-Top Varnish**—A pale, clear finish which rubs to a gleaming satin luster and develops the full beauty of the wood; highly resistant to moisture and beverage alcohol and will not develop white spots or rings, checks, or other imperfections from prolonged exposure. Also characterized by long-lived toughness and resistance to marring. . . . Has a time proven record.

**Bar-Top Lacquer**—Absolutely resistant to alcohol, liquors, etc. The answer to present day demands for a full-bodied finish. In gloss, gloss rubbing, and rubbed effect.

**Perfecto Flat Varnish** — A tough, elastic, spraying flat varnish made in various degrees of sheen for furniture manufacturers; can be rubbed to a mirror gloss.

**Alcohol-Proof Lacquer**—For wood finishing; suitable for bars, table tops, trays, etc. Made for spraying and brushing.

## Wood Finishes

**Aside from the materials listed under Furniture Finishes, the new developments in this classification include waterproof primers, air-drying and baking enamels, and something that has often been called for during the past year, namely, materials to use in treating soft wood to harden it and waterproof it.**

**Picklett**—Hardens soft wood by its action on the soft grain; makes all wood more resistant to decay; repels fungus growths and insect attacks. Makes wood surfaces less absorbent to finishing materials and, in some instances, saves one coat of sealer. Instead of darkening woods, it makes most woods lighter in color.

**Temp-Urd Wood Process** — Hardens and waterproofs wood; a synthetic resin is introduced or impregnated into the wood, to harden it and make it moisture resistant; prevents shrinkage, swelling and warping. The impregnation hardens the surface, affording substantial backing and eliminating the operation of filling the pores, or a primer coat. Lacquer or varnish may be applied to the impregnated wood. Golf club heads are treated to give

maximum hardness, resiliency and resistance to abrasion; baseball bats, to give them a high resistance to chipping and splitting. For handles, wooden bowls, trays; wherever a high, glossy, durable finish is desired, a second application of the material is made, resulting in a transparent finish.

**Toy Dipping Lacquer**—All the accepted colors. One-coat gloss on basswood, or pine by machine or hand dipping. Moderately priced for large scale production and competitive items.

**Valdura Wood Primer**—For old and new unpainted wood surfaces. Is a combination of waterproofing gums and tung oil; provides maximum surface adhesion and waterproof protection, as well as an excellent "tooth" for finish coats. Coverage runs as high as 500-sq.ft. per gallon.

**One-Coat Wood Enamel**—Has the general appearance of two or more coats. One spray or dip coat on practically any type of wood will give a uniform high luster. This coating does not strike into the surface, leaving dull spots. Recommended for inexpensive wood toys, sleds and furniture; is available in clear and colors.

**Black Baking Finishes for Wood Turnings**—Include fillers, building coaters, rubber finishes and jet black enamels for wood handles and all kinds of small wood turnings. Characterized by quick bake, good building and filling properties, ease of application, and hard mar-proof surface. These are highly specialized products designed to fill the needs of a particular industry, and have been developed in close cooperation with users.

**Tumbling Lacquers**—For small wood articles, toys, handles, etc. Non-poisonous in all the accepted colors. A high-gloss finish obtained on up to 15,000 pieces in 2 hours' production has enabled four batches in a 10-hour day or up to 60,000 units per color per day. Excellent coverage, full-bodied finish, high gloss, a new standard of excellence in tumbling finishes.

**Benite**—An aid to paint; a varnish substitute; colorless, a penetrant moistureproofer. Can be used clear or with ground-in-oil pigment colors for wood finishing. Also useful for waterproofing and finishing the surfaces of brick, concrete, Terrazzo, plaster, etc. Used in paint, it prevents cracking, peeling and blistering, and exudation of pitch; makes paint last longer and increases its moistureproofing effectiveness. Excellent for wall boards. Adheres tenaciously to metal and prevents rust and adheres to galvanized iron without preoxidation.

## Paper, Leather, Rubber, Fabric

Flexible, durable coatings for the surfaces of paper, leather, rubber and fabric are extensively used, and several interesting improvements and developments in finishing materials for this class of work are being made available from time to time. Those included here are only a few of the highlights.

**Clear Glazing Finish**—For paper, for application by paper roll-coating machines. Fast drying, durable, waterproof, flexible and free from tackiness.

**Lacquer That Stretches**—A lacquer coating that rivals the flexibility of

**FLOCKS**
**AND STAPLED FIBRES**
Rayon — Cotton — Wool
FOR ALL PURPOSES
Submit your Flocking Problems to us and let us furnish proper fibres for your products.
**STAPLED FIBRES CORPORATION**
16 Blount Street, Providence, R. I.
*Flock and Coated Products*

★ AT W. & J. SLOANE'S

IT'S SHERWIN-WILLIAMS

FINISHES

Whether it be their exclusive reproductions or furniture for the budget buyer, S-W Finishes are part and parcel of the distinctive W. & J. Sloane Master Craftsmen line.

Stains . . . fillers . . . lacquers . . . varnishes . . . enamels . . . the right finish for each type of surface and finishing requirement.

In the upper picture a skilled finisher may be seen antiquing a reproduction. S-W glazing liquid is brushed on and then rubbed in panel centers with cheese cloth. Stippling with a soft brush licks up wet spots and brushing lightly blends the stains.

In the lower picture an expert with the spray gun gives just the right tone and shading to this handsome adaptation from a writing table used by the Earl of Burlington.

S-W shading and finishing lacquers are used to build up the beauty of this crotch and swirl mahogany handcarved piece. S-W industrial finishes are serving all industry. They can serve you. Write The Sherwin-Williams Co., Cleveland, Ohio, and all principal cities.

SHERWIN-WILLIAMS

FINISHES

COVER THE EARTH

• SEE THE SHERWIN-WILLIAMS FINISHING ENGINEER

live rubber; when this lacquer is applied to a piece of live rubber and the rubber is stretched to the breaking point, the finish does not chip or brittle off at all. This stretchable coating comes in a clear and aluminum color, and can be applied by dip, brush or spray gun.

**Bentex** — A proven treatment for waterproofing, weatherproofing and preserving canvas, silk, linen and other textiles—but not woolens. Is colorless, non-corrosive and prevents mildew. Surfaces can be washed; textiles remain soft, pliable and dry; may be applied over other preparations; no injury from folding or wrinkling; prevents shrinkage and drawing.

**Superflex Leather Clear Lacquer No. 20914**—A clear transparent lacquer-base material for use on leather; possesses extreme flexibility and unusual adhesion; will not crack white nor show white upon continued creasing; is extremely long in life; dries rapidly . . . . to a wax-like gloss; requires thinning with lacquer thinner No. 1665 in about equal parts for spray application.

**Finish for Hard Rubber**—A baking finish for application by spray; can be made in almost any color; gives perfect adhesion to hard rubber and to molded surfaces such as Bakelite.

**Cophane**—A lacquer for label and paper coating; embodies the desirable gloss and economy of label varnish and at the same time imparts waterproofing and alkali-resisting qualities to the paper. Labels finished with Cophane will work perfectly on food products when packed at high heat temperatures and through high speed automatic wrapping and labeling machines. This lacquer is applied in regular coating machines without special attachments, at speeds averaging 1000 to 1400 sheets per hour.

**Benoleum** — An exceptional treatment for prolonging the life of plain, inlaid and battleship linoleums on floors, desks, tables, etc. Prevents cracking; impervious to hot water, greases and hot dishes; does not discolor or turn yellow. Keeps clean longer and cleans faster.

## Repair Putties

Here's something that when "you need it bad, you want it good." Repair putties for filling, building up, patching and smoothing over damaged places so expertly that the patch can not be seen, are necessary items in factory finishing departments and in the service departments of up-to-date retail stores.

**Lacquer Burning-In Cement**—For repairing holes, dents, scratches and imperfections in wood, metal, etc. Will not raise, soften or become affected by any type of lacquer. Made in transparent, wood finish colors and in solid enamel colors.

**Vit-Re-Pair**—An instant-hardening filler cement for repairing cracked or damaged surfaces on various porcelain finished products and appli-

"We use some synthetic enamels and lacquers; also feature pearl essence finishes which have improved not only the appearance but the sales of our products. In our business, it isn't so much the cost of materials used as much as it is producing ideas that have real sales appeal. In our limited experience, we have never seen any finishes that have more appeal than the pearl essence which we feature on cigarette lighters and bullet pencils."
—O. S. L. Co.

ances; is put up in convenient tubes; easy to apply, lustrous and permanent; supplied in several shades of white, black and special colors.

**Horn Porceline Patch**—Repairs chipped porcelain easily, quickly, economically, permanently. A white liquid cement which hardens with a body, color and luster similar to porcelain. A waterproof cement for broken china. Welds cracked seams in linings; cements nameplates without drilling. . . . Is available in two shades of white—light white and dark white. These shades may be mixed in any proportion to match the exact shade of white desired. To color Porceline Patch, use colors ground in japan.

## Solvents

Here are a few of the many new solvents for use in formulating and thinning finishing materials, particularly nitrocellulose lacquers, varnishes and synthetic resin finishes.

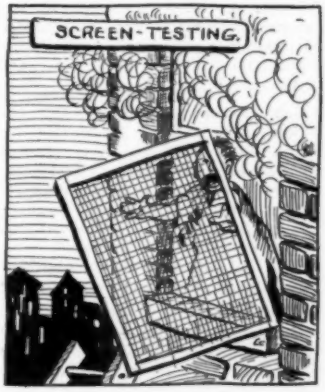
**Tributyl Citrate**—A plasticizer in nitrocellulose lacquers and dopes. . . also a very efficient anti-foam agent for water dispersions.

**Tributyl Phosphate**—A stable liquid of low volatility with a boiling point of approximately 347°F. at 23 mm. of mercury. It is a super-high-boiling solvent for nitrocellulose lacquers, dopes and inks, and an excellent plasticizer for celluloid. It is finding use in lacquers and in nitrocellulose-base primers and surfacers where its characteristic of imparting excellent adhesive properties to the film is especially important.

**Methyl Lactate**—An excellent cellulose acetate solvent; has high tolerance for diluents and an evaporation rate about 70% that of butanol. Its good flow-promoting and blush-resisting characteristics make it one of the outstanding cellulose acetate solvents for use in lacquers and dopes.

**Hercosol No. 80**—A special varnish and lacquer solvent that is made under a patented process from pine oil; consists chiefly of terpene hydrocarbons and ketones. Used chiefly as a special, high-boiling solvent for nitrocellulose lacquers. When used in small quantities in brushing lacquers, dipping lacquers and lacquer enamels, it imparts greater flexibility, better luster and better flow. A solvent and anti-skin agent in synthetic resin varnishes and enamels.

**Butyl Lactate**—Finding an increasingly wide use in the formulation of lacquers for special purposes, as well as in certain types of varnishes. In many cases, where very rapid final drying is not essential, or where forced drying is used, a moderate percentage of butyl lactate is being employed in the high-solids lacquer because of its excellent flow-promoting properties and its high tolerance for diluents. In fact, by the use of this solvent, high-solid content lacquers are now being formulated which have such excellent flow characteristics that no sanding is required. These "non-sanding" lacquers are being used in increasing quantities by finishers who are on the alert for methods of reducing finishing costs.



**Shellacol** — "The Handy Solvent." A proprietary solvent of wide industrial utility . . . . has all of the valuable solvent characteristics of completely and specially denatured alcohols and, in addition, has a number of advantages over industrial alcohols. Has an agreeable odor. An excellent solvent for a wide range of materials such as shellac, spirit-soluble gums and resins, dyes, stains and oils. In addition to the regular grade of Shellacol which contains approximately 5% of water (the amount normally present in the industrial alcohols) an anhydrous grade is also available for certain uses where a water-free solvent is required.

## Miscellaneous

**In this miscellaneous group are finish coatings for foliage, buttons, beads, bottle caps, collapsible tubes, cables, batteries, machine tools, building stone and concrete; also process paints and marking paints; waterproof and heat-resistant finishes, etc.**

**Clear Topcoat Lacquer**—A water white product, making a tough, hard protective film, particularly made for use over white lacquer enamels to reduce yellowing to a minimum.

**White Lacquer Undercoat** — Has exceptional building properties without sacrificing quality of film. On multiple-coat jobs, a saving of coats is the usual result.

**Cablo Arcozon**—A high-tension ignition cable lacquer formulated to withstand unusual testing conditions such as high heat, hot oil and cold, as well as being non-inflammable. Has remarkable insulating properties; increasing the dielectric and corona resistance of the high tension cable. All these qualities obtained at a great reduction in finishing cost.

**Battery Lacquers** — Finishes for batteries include gloss and flat, clear and black lacquers, veiling lacquers, spatter lacquers, and roller-coat enamels. These lacquers will not turn green over sealing compound and are very flexible; will stand outdoor exposure. They dry in from five to ten minutes and are acid resistant.

**Foliage Finish**—A special coating formulated for manufacturers of florists' supplies, for use on holly leaves, palm leaves, and other foliage. Has a permanent flexibility equal to that of the original leaf when fresh and living, and is shaded to match the living foliage. Not only is the shade similar to that of the plant in question, but also the sheen, so that it is extremely difficult to distinguish between the living plant and one coated with this material. This coating also has a remarkable adhesion to vegetable tissue, and will not crack, chip, or rub off. It is applied by spraying, and air dries in 24 hours.

**Machine Tool Finishes**—Provide a decorative, smooth, non-glare surface; are resistant to lubricating oils, grease, gasoline and cutting oils; hide solidly in one coat. Obtainable in quick-drying oil-base, lacquer-base or synthetic materials; for spraying or hand brushing. Standard colors: machine tool gray, light gray, green and black.

**Topcoat Crystal Lacquer**—The entire finish by this method comes down to the following brief outline: If on wood, use one coat of QS-203 surfacer in the desired color, followed by one coat of Impenetro CMX. This is dried for from one to three hours; then one coat of Kristokrak in the desired color is applied. This, in turn, is allowed to dry and followed by a coat of Impenetro CMX which, after it is dry, may receive a coat of any good clear wood lacquer—sprayed on and, if desired, rubbed down and polished. By this method, various novel effects are possible which were not available heretofore.

**Liquid Rubber Coating** — Selfvulc liquid and plastic rubber compounds

# "To all outside appearances . . "

How often do we hear this expression, indicating an opinion based on what the eye sees. Check your own preference for a product you are about to buy for the first time. The chances are, your choice is determined largely by its appearance.

That is why it is essential that product finishes be selected with utmost discrimination. Is the finish on your product the most suitable for the purpose, considered from all angles — appearance, durability, economy of application? If not, may we remind you that the research laboratory of this Company has been solving difficult finishing problems for sixty years?

**MAAS and WALDSTEIN COMPANY**
430 Riverside Avenue, Newark, N. J.
*Branch Offices and Warehouses:*
1336 Washington Boulevard CHICAGO
1228 West Pico Boulevard LOS ANGELES

are suitable for use as protective coatings—to protect surfaces against corrosion, abrasion, chemicals, damage or noise from impact. Selfvulc liquid rubber is 90% pure gum. Since it is cold-cured, it will not harden, age, oxidize, crack or blister . . . does not deteriorate with age but retains its resilient rubber qualities indefinitely; withstands heat up to 200°F., and cold to 120° below zero; can be brushed, sprayed or dipped.

**"Triple Life"**—A transparent surface coating that is highly resistant to the elements; for use on any surface such as paint (interior or exterior) varnish, lacquer, metal, etc., that tends to oxidize, fade, become dull, or tarnish when exposed to the atmosphere; dries rapidly, leaving a thin lustrous film.

**"Waterlox Water Repellant"**—A thin, water-white, non-staining material which has the property of moisture-proofing fiber, fabrics, paper, stucco, limestone, marble, imitation marbles and travertines . . . has excellent penetrative qualities and does not materially change the color of the surface to which it is applied. Does not seal porous surfaces, but rather leaves them in their natural physical condition and rejects or repels moisture through chemical reaction.

**"Waterlox Transparent"**—A clear waterproof finish; resists action of salt water, salt acids, acid fumes, calcium chloride, extreme heat and cold; is elastic, will not crack, chip, or peel. When dry, it has valuable fire-resisting qualities; is a light viscuous material, practically transparent upon drying in air. Will withstand temperature variations of better than 65°F. minus to 600°F. plus, therefore may be baked to accelerate its drying when desired; is now being used as a basis or vehicle for paints and enamels, as a clear waterproofing material, as a varnish, and as an impregnating material.

**Quick Drying Synthetic, QS-398**—Has remarkable hiding quality; air dries out of dust in 10 to 15 minutes, and to pack, overnight at room temperature. This formula also made for bake application. . . . QS-411. This is the same as QS-398, except that it is made to be baked rather than air dried. Even the most complicated shapes may be dipped in this type of synthetic; free flow and no drip marks; also, almost total absence of float. These materials necessarily demand modification for some special jobs. However, for most requirements, these materials are satisfactory as formulated at present.

**Process Paints**—Made in various fast-drying, non-fading colors for use on paper, cardboard, cloth, silk and velvet. Finely ground to prevent clogging in the screen. Manufacturer says: "In connection with the above we have perfected a transparent extender which not only extends the paint from 50% to 300% further than other extenders, but adds to its drying qualities, thus adding to production. Leaves a clean-cut impression (a vital necessity) and as a further aid to production the screen rarely has to be washed."

**Sur-Mac**—A heat-resistant coating for buttons, beads, tin cans and collapsible tubes. Withstands 1,500°F.

"I hope I am not too severe on our present day synthetic finishes, but up to date I have failed to find a satisfactory substitute for lacquer. My work is 90% on dental equipment, which demands a high grade finish over the old work; by this I mean, the prices do not permit of removal of the old finish. I have to contend with nearly every grief that a finisher could run up against."—E. A. C.

**NO MATTER WHAT QUALITY LACQUER IS REQUIRED . . . WHETHER FOR COATING FINE MOTOR CARS OR INEXPENSIVE TOYS . . . THAT LACQUER CAN BE PRODUCED MOST ECONOMICALLY AND USED MOST ECONOMICALLY IF IT IS FORMULATED WITH BUTANOL AND BUTYL ACETATE.**

COMMERCIAL SOLVENTS CORPORATION

230 PARK AVENUE, NEW YORK, N.Y.
AND TERRE HAUTE, INDIANA

(white heat) without cracking, peeling or coming off; is flexible, pliable, non-poisonous, and is unaffected by heat, cold, steam or dampness. Freezing temperatures do not "gray" it or make it brittle. Its hardening action is purely an oxidation so there is no chemical change or reaction to be feared in conjunction with other materials. It is not "thermoplastic" . . . the hotter it gets the harder it becomes. Can be thinned with petroleum solvents. Can be applied by spraying, brushing, roller-coating or knife spreading.

**Baking Lacquer to Withstand Chromium Plating Operation**—Dries in the normal lacquer time. Following application, the finish may be baked at a temperature of 250°F. for one hour, producing an exceedingly tough surface that can be buffed to a high luster. In spite of the toughness of this material and its ability to withstand buffing, it retains very good flexibility. Finished pieces may be buffed to a glass-like surface and the highlights buffed clean. Subsequent to this, the entire piece may be immersed in either a gold or chromium plating solution in order to electroplate the highlights. This material, supplied in any color, lends itself admirably to novelty finishing.

**Lithocrome Finishes**—Have unusual resistance to the action of acids, alkalies and solvents. Are particularly suited for specialty work where finishes come into either incidental or constant contact with alcohol or alcoholic mixtures. At present they are chiefly whites, blacks, golds and clears. The white, black or gold types, when used over No. 1067 size, are finding wide application in caps for pharmaceutical products. Some of the clears are exceedingly lustrous and make ideal coatings for trays, as they resist the action of all types of beverages. Other clears are used for beer-can lining and are the one type which will successfully protect beer in metal containers for any reasonable length of time. These materials have been greatly improved during the year. Some are supplied for coating machine application.

**Wipe-On Finish**—"An ideal brushless durable finish" in high gloss or flat, for wood or metal; is applied by wiping it on with a soft cloth. According to the manufacturer, "it is not affected by hot water, hot dishes or alcoholic beverages, and will not show press marks."

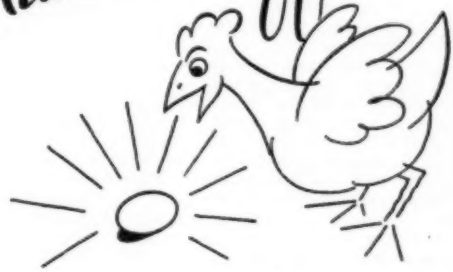
**"Rub-it-on" Varnish**—A finish containing Bakelite; for coating linoleum, floors, woodwork and furniture. Apply with a lint-free cloth or an applicator or a brush. Dries in one hour; is glossy, pale, elastic; wears well. For greater durability or extra hard service, put on a second coat. Resists water, alkali and soap solutions, grease, oil, alcoholic beverages.

**Chemox**—An acid and alkali-resisting finish for walls, floors, tanks and surfaces exposed to acid, alkalis, gases, etc. Furnishes excellent protection for metal exposed to corrosive conditions. Has good adhesion, luster, and covers in one coat. Made in colors; also clear.

**Lithiceal (Any Color)**—A practical coating for cement and concrete, penetrating deep into the porous surface and sealing in the voids. Is resistant to water, oil, alcohol and

# FRESHNESS

## *Makes a difference*



ALL shellacs are not alike. They vary in quality. And they vary in effectiveness in proportion to their freshness.

Du-Pros is made only from pure shellac gum and Government test alcohol. To insure quick drying, easy sanding and a tough, durable finish, every gallon of Du-Pros Strictly Pure Shellac is freshly made when shipped.

Other fine Day finishes are enamel, stain, filler, sealer and lacquer.

**DU-PROS**
*is fresh shellac*

**JAMES B. DAY & CO.**

**• CHICAGO •**

soap solutions, as well as all acids and alkaline solutions within reasonable limits. Carries the pigments to the farthest depths of penetration, therefore can be made permanently decorative in all practical colors. Its preservative and decorative qualities are as lasting as the surface of the concrete. Will not chalk, flake or peel; after curing, it hardens without causing surface brittleness. An ideal protective coating for concrete, cement, plaster, brick, tile and stucco walls . . . in any color desired.

**Chem-O-Lith Solvent**—A specially prepared penetrating solvent that will enter into the pores and cavities of concrete and lift all grease, oil and combined foreign matter to the surface so it can be readily wiped off clean, leaving the surface body of cement to a reasonable penetrating depth free from all deleterious matter. Chem-O-lith Solvent is always safe to use, as it is non-explosive and very slow burning.

**Chem-O-Lith Process No. 404**—A chemical treatment for lithic surfaces. Will withstand practically all destructive agents, such as fatty acids and oils, solvents mineral and spirit, acid dilute or concentrated, caustics, heat; and it is infusible. The process involved the formation of a black insoluble resin in the pores of the coated surface. The protective coating dries rapidly and leaves non-porous film that can be polished to a high gloss and will retain its luster indefinitely. Particularly adaptable to concrete walls or floors subject to disintegrating factor. Used as a floor coating, it leaves a hard durable finish which will withstand heavy traffic and considerable abrasion. Material penetrates into the pores of the concrete . . . wood, fiber and pressed materials can be treated in the same manner, although being black, it may be recoated with any other colored paint without bleeding through.

**Markal**—Real paint in stick form; easily applied to any wet or dry surface; will not run when applied to hot metals; the newest development for marking products and materials. Can be carried around in the pocket as easily as a pencil. Does not dry out in stick form; hardens only after application; made in two types—one for cold marking, the other for hot marking.

Markal for cold marking is used for marking all metals, glass, cardboard, boxes, crates, lumber, building stones and blocks. Dries and remains as permanent as any other high quality paint.

Markal for hot marking is used on steel shapes, forgings, castings, pipes, billets. It marks clearly and permanently at any temperature from 300° to 1,200°F. Does not run or flow while hot, or peel off after cooling. Is weatherproof.

**Salt-Resistant System**—A primer and enamel for the utility field. Although practically any color can be made in this type material, best results are obtained in the darker colors, such as gray, green and black.

"What we want in finishing materials: 1) More variety of sheens in synthetics. 2) Some code of ethics wherein the purchaser is assured of getting real synthetics; many so-called today are not genuine. 3) Properties to make synthetics more stable after opening the can, if not immediately used, such as is the case with lacquers. The reason synthetics are, in many cases, displacing lacquer: Solids in lacquer, 11% to 19%; solids in synthetics, up to 50%. During the speed craze many firms were over-sold on lacquer and although it has a definitely valuable place in industrial finishing, it has been often used unwisely."—A. W.

# A Sparkling Finish is as important to a Product as a Paddle to a Canoe!

You may have a product that is a stand-out in your particular line . . . yet sales may show only a sub-normal average volume. Why? The product just misses . . . it lacks the power of attraction . . . lacks sales appeal.

Let our creative studio analyze your product . . . it is maintained especially for that purpose . . . and has been directly responsible for upping the sales on many languid items . . . it is worthy of consideration. As the old saying goes . . . don't be caught up the creek without a paddle.

Write for details. There is no charge for our studio service to reputable firms.

*"No tampering with quality"*

Rockford Varnish Co.

ROCKFORD, ILLINOIS

**Dum Dum Masonoc**—A weatherproofing for stucco, concrete, brick, cement, etc., differing from other products for similar uses. Tested for 20 years under severe tropical conditions, as well as northern climates. Hundreds of Masonoc jobs went through the recent Florida horricane where rain driven by 130 miles per hour wind, kept interior walls dry.

## Finishing Room Fires

ONE OF our larger industrial plants using the bonderite treatment on steel before painting, recently had a fire in this department, which should be a warning to others using this process to take proper precautions. It is customary and recommended that the bonderite treatment be followed with a rinse in a weak solution of chromic acid. The ware is then passed through an oven and the streaks and spots of chromic acid remaining after the drying are removed by wiping with a cloth dampened in alcohol. So much for the process.

In the storing of supplies, a drum of alcohol was placed next to a drum of flake chromic acid—a harmless arrangement on paper. Nothing happened for quite some time, but then one day a few crystals of chromic acid were spilled on the floor and a little later, in drawing alcohol from the drum, a few drops of the solvent were spilled on the floor next to the chromic acid crystals. Immediately there was a flash and in no time the whole drum of alcohol was on fire as well as the surroundings.

Only a well-organized fire squad and equipment quenched the fire and saved the plant from what might have been a major catastrophe for the company.

Investigation showed this to be a characteristic reaction. When a little alcohol acts upon the chromic acid, so much heat is generated that the "kindling point" is reached. However, if the chromic acid is flooded with alcohol, there is sufficient liquid to absorb the heat generated, and the heat is dissipated as fast as it is formed. I am passing this information along, as this fire hazard is not generally known.—E. G. SANDER.

## Chemical Catalog

The latest edition of an interesting catalogue entitled "Chemicals by Glyco" has just been published. Several new products which were on display at the recent Chemical Exposition are fully described. Among these might be mentioned Diglycol Laurate, Abopon, Proofit, a one-bath waterproofing agent, Lohrinol, a wetting agent especially suitable in acids and hard water.

A welcome addition to the Chemical and Physical tables has been the inclusion of pH tables of the most common acids and bases.

The Glyco Products Co., Inc., 949 Broadway, N. Y., N. Y., will be glad to send a copy to any executive, chemist or technical worker, on request.

# METAL RADIO TUBE

# BLACK

**The same Black air-drying Lacquer now used by many of the large producers of radio tubes, is available for general use where quality and economy are primary requisites!**

***This unusual* STANLEY BLACK *is used on metal radio tubes because—***

**1** **It is quick drying and initially hard, durable and of excellent adhesion.**

**2** **It is extremely economical, being inexpensive and of great covering power.**

**3** **It can be baked or heated indefinitely at 350°F., as in the case of radio tubes, without smoking or giving off any odor*.**

**4** **Such baking increases the hardness and adhesion, and improves the appearance.**

**This new type of Black Lacquer will serve wherever the best possible dull black finish is desired on steel, brass or aluminum.**

*Slight smoking and some odor is noticeable during first 20 minutes at 350°F. NONE thereafter.

**Ask for a sample—or Five Gallons at the drum price —for trial.**

## THE STANLEY CHEMICAL COMPANY

EAST BERLIN, CONN.

**LACQUERS - SYNTHETICS - ENAMELS - JAPANS**

*A Subsidiary of* THE STANLEY WORKS, New Britain, Connecticut

# Refrigerator Finishes—III

by A. O. Plambeck
Assistant Technical Director
Roxalin Flexible Lacquer Co.

**In this last article the author gives a summary of timely facts about the refrigerator finishes, especially lacquers and synthetic enamels, their characteristics and the important features to consider when different kinds of metals are used for cabinets of these mechanical refrigerators.**

WHILE it may be possible to develop a finishing system and materials to satisfactorily meet all the tests discussed in detail in Parts I and II of this article (in Nov. and Dec. issues), very few refrigerator finishes now on the market will do so. Of course, no two refrigerator manufacturers put the same amount of stress on each individual test, and in order to meet one particular requirement to a very high degree, it may be necessary to sacrifice somewhat the characteristics of the finish with reference to another particular test or group of tests.

One particular manufacturer may feel that for his type of trade and customers, his refrigerator finish should be more resistant to certain conditions and tests than to others, while another manufacturer catering to a different class of trade will have certain other requirements. If these particular points are brought to the attention of the supplier of the finishing materials he can, through his experience and technical knowledge, produce a finish that will take care of the individual manufacturer's problem.

### *Two Distinct Types of Finish*

In general there are two distinct types of refrigerator finishes available on the market today—lacquers and synthetic enamels. The choice of the type of finish to use depends largely upon the equipment and production schedule of the refrigerator manufacturer. A lacquer refrigerator finish possesses certain advantages and certain disadvantages, while the synthetic finish, in order to give maximum satisfaction, requires the installation of special baking ovens and air-washing equipment, which of necessity limits this particular finish to the larger manufacturers who run a large volume production.

### *Lacquer Finish*

A lacquer finish is very durable and permanent. Usually it consists of one coat of primer dipped or sprayed, which can be air-dried or baked, and one or two

convince *yourself!*

**We believe there are *many* products in our line, superior to *any* other on the market and would like to prove it to *you* at *our* expense. . . . Let us submit free working samples of a few *exceptional* items.**

**No. 1000 (Recessed) GLOSS LACQUER.....(Heavy body—water white)**
**No. 2000 (Recessed) FLAT LACQUER.....(Real rubbed satin finish)**
**No. 3500 SEALER.....(Quick drying—easy sanding)**
**No. 1900 WATEROIL RUBBING OIL.....(Eliminates haze or bloom)**
**WATEROIL STAINS.....(Acknowledged leader in stains)**
**DOLCO FILLERS.....(Quick drying, real fillers)**
**LIGHT-FAST SHADING STAINS.....(Eliminate fading, blend perfectly)**

***You will be amazed at the unusual merits of all these items.***

**V. J. DOLAN & COMPANY, Inc.**
**1830-32 NORTH LARAMIE AVENUE CHICAGO, ILL.**

*"Unquestionable Quality"* *Wood Finishing Supplies*

*Finish* **small parts**
**better • faster • less cost**

You can do that by putting them in the Filwhirl Enameler, which by centrifugal force, completely coats every crevice and corner. It's the modern way of coating parts or pieces in multiples rather than singly. Let us have samples of your products, and we'll coat them for your inspection, and give you full information about this wonderful machine. Few concerns can afford excessive finishing costs, and this is the answer. Write us!

**THE LEON J. BARRETT CO., Grafton Street**
**Worcester, Mass.**

***The Filwhirl Enameler . . . .***

coats of lacquer enamel sprayed and air-dried or mildly baked, such as 15 minutes at 150°F. The lacquer finish has good adhesion, flexibility and humidity resistance; it also resists grease, light discoloration, refrigerant gases, printing and alcohol. The disadvantages are its slightly increased cost, as compared with synthetic enamels, and slightly less luster than is obtained with synthetic enamels.

***Synthetic Enamel Finish***

The chief merits of synthetic enamel finishes are their good adhesion, superior covering capacity, and high gloss finish. For best results it is usually customary to apply three coats, baking each coat. The primer is usually baked at a temperature of 350° to 425°F. for 45 minutes to one hour; the intermediate coat is baked at a slightly reduced temperature, say 325° to 375°F. for one to 1¼ hours; and the final coat is baked at 250° to 300°F. for two to 2½ hours. A 3-coat baked synthetic finish has a high gloss which very nearly approaches a porcelain finish. It is also very flexible, elastic, tough, grease resistant, and humidity resistant. The chief disadvantage is in the cost of installing and operating an oven and air-washing equipment to insure freedom from dust and specks on the finish. The oven must be properly ventilated to eliminate any tendency toward discoloration.

Some synthetic finishes are very easily discolored by refrigerant gases, while others fall down in resistance to humidity or salt spray. On cheaper cabinets it is possible to secure an economical finish by using a one-coat synthetic enamel with a low temperature bake. This will not have much humidity resistance or resistance to discoloration and refrigerant gases, although it does prove economical in production.

***Porcelain Enamel***

A porcelain finish, while it meets practically all tests of humidity resistance, refrigerant resistance, grease and butter resistance, and discoloration resistance, has the disadvantage of brittleness on impact, and the difficulty of patching the finish on any damaged places. For this reason most of the refrigerator cabinets now on the market are being finished in either lacquer or synthetic enamels.

***Types of Metal Used for Refrigerator Cabinets***

The types of metal commonly used for making refrigerator cabinets include steel, bonderized steel, galvanneal, and galvanized iron.

Steel, the most common metal used, presents no particular finishing problem. A good clean surface is required in order to secure proper adhesion of the primer. Cleaning is generally accomplished by washing with benzine or lacquer thinner and wiping with clean cloths. It is also important to see that all rust spots are removed, by using suitable abrasive paper.

Bonderized steel is now quite common in the refrigerator field. It serves the double purpose of preventing the spread of rust underneath the finish, and giving an improved surface for adhesion of the primer. I will not go into details about the bonderizing process which is well known, but will merely mention that the bonderized surface should be

wiped off and cleaned with a cloth moistened with benzine or lacquer thinner to remove all traces of grease, oil, or perspiration, which may have accumulated on the surface due to its being handled.

Galvanneal is not so commonly used, and it presents some difficulty in regard to satisfactory adhesion of the finish. However, a good primer on a clean galvanneal surface will give satisfactory results, although some tests indicate the finish does not have as good humidity resistance, flexibility, or impact resistance as on steel.

Galvanized iron presents still more difficulty in regard to satisfactory adhesion. I recommend washing the surface with a 10% solution of copper sulphate or a mild solution of acetic acid or vinegar, in order to secure proper adhesion of the primer. Even with careful treatment the same finish will not show as good humidity resistance or other characteristics as when used on steel.

Wood cabinets are still used for ice refrigerators, but are seldom if ever supplied for use with electrical refrigeration equipment. In order to secure a satisfactory finish on a wood refrigerator cabinet it is necessary to first apply a satisfactory wood primer, following with a good grade of lacquer enamel, oil enamel, or a synthetic enamel. Finishes used on wooden refrigerators are not tested as thoroughly, and are not required to stand the same rigid tests as are usually expected of the finish employed on metal cabinets for electric refrigerators. In other words appearance and economy are the chief requirements of the finish used on wood boxes.

## Sixth Packaging Exposition in New York, March 3-6

The 1936 Packaging Exposition will be held March 3 to March 6 at the Hotel Pennsylvania, New York, N. Y. It will be larger in area and more varied than the 1935 show. Exhibits now being prepared by participating companies include displays of packaging machinery, barrels, molded products, celluloid wraps, fiber containers, metal cans, corrugated containers, transparent cellulose wraps, parchment wraps, adhesives, tubes, glass containers, foils and metals, fancy containers, display racks, folding cardboard, stencil equipment and lacquers.

Concurrent with the Exposition will be a series of conferences, clinics and round table discussions devoted to every phase of packaging, packing and shipping. The tentative program provides for two of the four days' sessions to be devoted to the problems of the unit package, and two to various phases of packing and shipping.

## S. B. Totten Joins Berry Bros.

The new manager of the Atlantic Division for Berry Brothers is S. B. Totten (Sam, to his friends). Mr. Totten will have charge of the New York and Philadelphia branch districts which are known in the Berry organization as the Atlantic Division.

Mr. S. B. Totten new manager of the Atlantic Division for Berry Bros. Offices are at Brooklyn and Philadelphia.

Offices and warehouses are at 129 26th St., Brooklyn, N. Y., and Delaware and Tasker Streets, Philadelphia, Pa.

For many years Mr. Totten was manager of the Detroit and Cleveland branches for the DeVoe & Reynolds Co. His appointment as head of the Atlantic Division is a forerunner of the reorganization of this eastern territory. Mr. Totten's many years' experience in the paint and varnish industry, makes him a valuable acquisition to the Berry organization.

## Finishing Philippine Lauaan Mahogany

We are contemplating the use of Philippine Lauaan mahogany plywood panels. The Lauaan veneer used will be only quartered sliced, ribbon-grain figure. Will we run into difficulties in finishing these panels with a stain and lacquer finish?—C. C. Co. (Soda Fountains).

---

*Editor's Note: The latest information we have about finishing this Philippine wood is contained in two articles by Orrie D. Maal, Western Industrial Representative at Los Angeles, Calif., for S. C. Johnson & Son, Inc. Excerpts from these articles, published in the 1935 June and August issues of "Industrial Finishing" follow:*

It has been a big problem to get a good looking finish on this wood because the large pores (particularly in the cheaper grades) absorb finishing liquids like a sponge. Water stains especially give trouble, more so on veneers than on solid wood and, due to the raising of the grain, you are likely to get a poor job of filling, making the final finished surface appear muddy looking.

However, by filling first, then following with a coat of lacquer sealer, sanding, and spraying with a lacquer shading stain, a fairly presentable finish can be obtained. But the wood is always covered up completely on the darker spots and, when scratched, it is impossible to make a decent patch job because the scratch usually goes down to the filler. Some cheap furniture is still finished this way.

# Questions « Answers

Oil stains have entered the picture in connection with finishing Philippine mahogany. The best of these (according to my experience) are the so-called pigment or wiping stains. These are being used extensively today for the cheaper finishes.

When the permanent and non-grain-raising stains were developed, this wood really came into its own—and some very beautiful finishes are now being produced. Some of these are the waxed finishes without filler—one coat of permanent stain; one coat of lacquer sealer; sanded; one coat of flat lacquer; steelwooled and waxed, using a paste wax to fill the pores.

Some of the better grades of finish are obtained by the following method: a very light coat of permanent stain; then shaded and highlighted by skillfully using the stain full strength; lacquer sealer; sanded; flat lacquer; steelwooled and waxed.

If a dusty finish is desired, rottenstone can be mixed with the wax, leaving it to the manufacturer whether to use liquid or paste wax. The paste wax naturally will help fill the pores of the wood.

In case a filled surface is desired, I would advise filling after the sealer has been sanded; then apply as many coats of lacquer, shellac or varnish as may be desired on the filled surface.

A beautiful finish can be ob-

*Yesterday—*

"Wood Lacquers"

TODAY—

3697 SUPER WOOD FINISH

A GRAND PIANO is not comparable with a midget radio. Neither is 3697 with "wood lacquers" of the usual type, made to sell at minimum prices. If the best is none too good for your product, remember 3697 only costs a trifle more. This trifle, however, permits us to use ingredients of surpassing qualities.

3697 has optimum resistance to graying, checking, cracking and scaling. It dries rapidly, recoats rapidly, but hangs on grimly to the wood.

At its best, wood is a treacherous surface for finish. We expect 3697 to be used on the best wood, carefully prepared. Try humidity and temperature-change tests on it. Test it for toughness. Notice the enduring brilliance of the finish.

*For the most critical—3697.*

*The*
VARNISH PRODUCTS CO.
5208 HARVARD AVENUE, CLEVELAND, OHIO

TO those friends whom we have served in the past we extend our gratitude for the confidence they have placed in us and which we have never violated.

To those who are interested in our products, who desire Quality and Service such as the LARKIN COMPANY offers, we extend an invitation to join the multitude who have found that our products meet all their requirements. Our service is personal—Quality second to none—Facilities unlimited.

We rededicate ourselves to a further and wholesome effort toward perfection.

*Larkin Co Inc.* PAINT DIV., Buffalo, N. Y.

Larcoloid, Enamels, Varnishes, Japans, Lacquers.

tained on the softer woods by filling first and then staining with permanent stain. This stain will penetrate sufficiently to make it safe from scratching; then proceed with as many coats of lacquer or varnish as desired.

I have had some ten years' experience working on Philippine mahogany with the manufacturers on the Pacific Coast, and I know that today some of the best stores in the country are handling California and Spanish furniture made of this wood.

## To Finish Salad Bowls

We are developing a wooden salad bowl, but have not determined just what is the best finish to use. These bowls will be turned out of solid wood—maple, birch, and walnut. We will appreciate any information you might suggest about treating or finishing these bowls. — A. M. Mfg. Co. (Veneer & Plywood Mfr.).

For an ordinary commercial finish, I recommend submerging the turned bowls for 24 hours in an impregnating solution. Remove, wipe dry, and cure for 48 hours at 110° to 115°F. Finish by buffing with tripoli on a buffing wheel turning it 1200 to 1500-r.p.m.

For a first class job, I suggest placing the bowls in an airtight cylinder or tank and pulling vacuum for about one hour. Then admit impregnating compound and raise the pressure in the tank to 90 or 100-lbs. per square inch for from four to six hours, at a temperature of 140° to 150°F. Buff with tripoli, and finish off with beeswax. The impregnating material is a synthetic compound made by a company (name on request) in New York. — A. J. Beecher.

For the inside of the bowl, I would not apply any kind of finish that will leave a film on the surface. I suggest using a clear varnish thinned down to the point where it will practically all be absorbed by the wood. Follow by wax polishing. A solution of aluminum stearate in naphtha might be good, as it would make the wood water repellant, but would leave no film on the surface.—P. J. M.

The only experience I have had in the finishing of salad bowls is to leave the inside natural, but apply a coat of synthetic enamel in color to the outside.—B. Nelson.

## To Paint Raised Letters and Ornaments

We are interested in an economical production method of painting, with colored enamel or bronze paint, the raised letters, trademarks and ornaments on finished cast-iron parts—something better than using a brush if possible.—L. M. T. Co.

I have noticed the following procedure for doing this work on cast-iron lawn mower wheels: Make one or more small bobs or pouncing balls about 1-in. or 1½-in. in diameter, using cotton waste as a filler and soft chamois skin as the covering. Tie it up tight so you will have a fairly hard bob. Mix your colors or bronze powders with a quick-drying varnish on a plate—mixing them to

# EVERYTHING YOU'VE WANTED

- Smoother Coverage
- Increased Production
- Greater Ease of Handling
- Complete Convertibility
- Lower Maintenance Costs

HIGHEST SPEED POSSIBLE

YOU'LL FIND IN THE Paasche HIGH PRODUCTION Airbrush

GIVE IT A TRIAL TODAY

Embodies every major improvement without sacrificing simplicity of design or operation. The New Paasche UBCH High Production Airbrush has everything! Greater speed; finer atomization; perfect coverage; convertibility; unmatched ease of handling; and by far the lowest maintenance costs. The few wearing parts (easily replaced) are built for extraordinary wear. This airbrush development gives you more uninterrupted hours of faster production and finer results at less cost than any other. Write for technical reasons why.

Paasche Airbrush Co.

1917 DIVERSEY PARKWAY
CHICAGO, U. S. A.

*THE WORLD'S HEADQUARTERS for manual and automatic airfinishing, aircooling, airrubbing, portable airpainting units, airfinishing booths and fireproof ventilating equipment.*

about the consistency of printers' ink. Pick up a small amount of the color on the face of the bob and rub over or pounce upon the letters, etc. When the bob becomes heavily coated and stiff, wash it off with benzine or gasoline. Girls can do this work very neatly and rapidly.—J. E. GREENE.

On lawn mower parts with outstanding letters, I would recommend applying the different colors with a roller. By running this over the surface, all raised letters will be colored in one operation. It is essential that the paint or enamel should carry the required amount of pigment to cover well and be sufficiently viscous that it will not flow over the edges.—CHAS. F. MOSS.

## Yes, Wood Will Stand Bake Finishing

In the November 1935 issue, page 40, C. L. T. Co. inquires if wood will stand a bake finish. A "Consultant on Finishing" starts out his reply by stating that "it is an unusual practice to subject hardwood turnings, enamel coated, to heat."

Having conducted a job enamel-plant for some 20 years (finishing wood and metal) I was rather surprised at the above question and statement in these days. Of course, baking wood turnings, handles, etc., at 200°F. and over, for black enamel finish, is common practice.

For many years we enameled birch and maple bobbins, several thousands per day, in gas-fired ovens. The first coat was tumbled on and baked in wire baskets having pine wood frames. Each basket held about two bushels. The bobbins were then stuck on racks and dipped, then baked at a temperature well over 200°F. for four hours.

Now the interesting part is this: The pine wood racks with wire pins and the wire baskets with pine wood frames were used for months, day after day, without any charing or harmful effects.

The wood bobbins were of several sizes and shapes, but all had a hole through the center. One style was about 7-in. long, with a ¾-in. hole, leaving the wood of the tube only about ⅛-in. thick. As these bobbins have to run true on the loom spindles, it readily can be seen that any change of contour or warping is out of the picture. After enameling, the bobbins are reamed just enough to remove any scars from the rack pins, but not to remove the enamel.

The principal object in enameling the wood bobbins is this: In service the bobbins are wound with textile material and then bobbin and all are placed in steam vats, hot dye kettles, etc.; and they have to stand up under this sort of treatment for a long period.

This should show that even hollow wood tubes can be enameled and baked without any change of

For Over 40 Years
Manufacturing Quality
**GOLD and SILVER**
**Colored Bronze Powder**
Write for our booklet—"The Why and How of Bronze Powder"
**The O. Hommel Co., Inc.**
Pittsburgh, Pa.

contour, checking, or such. The stock from which these turnings are made, however, must be properly treated. In enameling wood, the stock must be thoroughly dry. Otherwise there would be blow bubbles and pits when the turnings come from the ovens. The moisture escaping from the wood under the enamel coat, when heat is applied, is like blowing soap bubbles.

Now in the manufacture of the wood bobbins, which I just mentioned, the stock was roughed out, that is partly turned and cut to near length, and then thoroughly kiln dried. The stock was then bored through the center to spindle size, and the outside was turned to net size on automatic machines. After tumbling dry to smooth the surfaces, the bobbins were shipped from the bobbin factory to my place (just across the street) without having a chance to absorb any moisture. They were given a first coat of baking filler as soon as possible and put in ovens to bake. This was an oil filler which I prepared myself, and it was tumbled on.

For the finish coat the bobbins were racked up on racks of pine wood with wire pins. These pins were of different shapes and lengths to fit the holes in the different styles and shapes of bobbins. These pins were so formed that they made contact with the inside of bobbins in three places; when the bobbins were removed after baking there was apt to be small scars or rough spots in the hole, therefore they had to be slightly reamed to remove these rough spots so they would run true on the loom and winder spindles.

I experienced no trouble in the

**SEND FOR YOUR COPY!**

"THE METAL CLEANING HANDBOOK" is intended to provide a ready reference and guide for the use of those directly interested in or concerned with metal cleaning.

To these, a limited number of copies are available. A request on your business letterhead giving your official title or position will bring a copy. To all others, a copy will be sent on receipt of the nominal sum of $1.00 to cover the cost of publication.

MAGNUS CHEMICAL COMPANY
49 South Avenue Garwood, N. J.

Magnus
CHEMICAL COMPANY

Ross Systems

Air Heaters—
Oil and Gas Fired
Industrial Ovens
Drying Systems
Air Conditioning

J. O. ROSS
ENGINEERING
CORPORATION
350 MADISON AVE., N. Y.

Chicago Detroit Pittsburgh Portland, Ore.

bobbins warping or changing in any manner when baked at 200°F. for about four hours.

If the stock were not thoroughly dry, the turnings would be pretty apt to change shape somewhat, besides having pits and blow bubbles. — Allan J. Barber, Mfr. Toys & Novelties.

## To Color Indented or Sunken Letters

On some of our pressed metal parts, particularly shoe horns, and also on certain castings, there are indented or sunken letters and sometimes lines that we want to paint in a bright color. Is there a quicker or better way to do this other than with a striping brush?—N. J. MFG. Co.

The only process I know of for this class of work is to brush over the indented letters and lines with your color, doing this after your base finish is thoroughly dry. Wipe off the excess color lightly with a cloth dampened in benzine or alcohol, depending upon the solvents of your base finish. The colors should be of the quick-drying type. With a little experimenting, the exact time for wiping off the surplus color can be determined so as to leave a perfect clean-cut colored impression. —J. E. GREENE.

The indented surfaces can be colored in two ways. First by applying the material roughly with a brush and wiping off the excess on the surface with a cloth. Second, by using a small striping tool adjusted to the size of the groove. In each of these cases the enamel must be of a non-flowing nature in order that it will not draw away from the sides and be heavy at the lowest part of the groove.

In my opinion the brushing-on

COLOR TRANSFORMATION
BLANCHIT
Reg. U. S. Pat. Off.
Proven by International Use
Made by
L. R. VAN ALLEN & COMPANY
Chicago

"top quality" paint & varnish thinner
excellent for use in spraying, brushing and dipping.
SUNOCO Spirits
SUN OIL CO.
Philadelphia, Pa.

Pyroxylin Lacquers — Synthetic Enamels — Insulating Varnishes—Baking Enamels
IMPERVIOUS PRODUCTS
FOR INDUSTRIAL USE
IMPERVIOUS VARNISH COMPANY
KOPPERS BUILDING, PITTSBURGH, PA.
Protective Coatings — Finishing Varnishes—Primers and Surfacers
ENAMELS IMPERVIOUS TRADE MARK IVCO PRODUCTS VARNISHES LACQUERS

and wiping-off process could be used successfully on small pressed metal products like shoe horns. Apply the color on the surface over the indentations and wipe off excessive material with a soft cloth, leaving the letters filled with the color.

Another way, if the shoe horns are enameled all over, is to apply the name in the enamel and not the metal. This can be accomplished by using a reasonably hot steel die over different colored stamping papers. The hot stamp softens both materials, causing color to adhere to the indented surface when the die is withdrawn.

Still another way is to fill the type with a clear sizing varnish by the brushing-on and wiping-off process, and then apply dry color with a cloth pad or a soft brush, removing the extra color with a soft cloth. This dry color will adhere to the varnish, thus filling the letters with the required finish.—CHAS. F. MOSS.

---

Xylophone bars are made of Honduras rosewood, according to the Forest Products Lamoratory. Brazilian rosewood was formerly used, but the wood proved too soft to withstand the constant hammering of professional playing. In preparing the wood for xylophone bars the logs are quartered and the pieces are cut into planks 1-in. thick, which are air dried from two to seven years.

---

## Cudner & O'Connor Co., Chicago, Make Finishes

Cudner & O'Connor Co., an Illinois corporation, has completed installation of equipment and perfected facilities for the manufacture of special lacquers, stains, enamels, and varnishes at 4235 West Kinzie St., Chicago, Ill.

Both members of this firm have had excellent and varied experience in special wood and metal finishes for special purposes. Mr. H. E. Cudner, president and treasurer, is a graduate of Northwestern University, was salesman and salesmanager of James B. Day & Co. of Chicago, and recently was industrial sales manager for the Martin Varnish Co. of Chicago.

Mr. Thos. E. O'Connor, vice president and secretary, is a graduate of Marquette University, was technical formulator with S. C. Johnson and Son of Racine, Wis., superintendent of James B. Day & Co. of Chicago, and chief chemist of the industrial department of Martin Varnish Co. He is also the past president of the Chicago Paint & Varnish Production Club.

With their personal contact and experience with the trade, a number of products have been developed to fit special large-scale finishing problems successfully, and it is anticipated that wide-spread acceptance of these products augurs well for the success of the new enterprise.

---

## Taped Paper Cartons Stronger Shipping Containers

A corrugated shipping carton, carefully sealed with gummed tape, is more than twice as strong as the same carton with the flaps glued down in the usual way—according to the Container Testing Laboratory. The reason is that the weak points on these boxes are the horizontal end edges of the box. When you tape the box, you reinforce or armour these weak edges. When you glue the box, you leave them to the mercy of all the scraping, bumping and tearing that the box gets in a freight car or on trucks. However the sealing tape must be properly moistened and applied to be really effective. Too much water makes air bubbles which later allow the tape to peel off; too little water makes the tape seem to stick when it really isn't properly stuck on.

---

TECHNICAL ADVISERS

If your finishing problems pertain to Metallic Finishes—such as Gold, Silver, Antique, Copper and various other colors and your present source does not meet your exact requirements, please address us for complete technical advice—as the authority on Metallic Finishes for 32 years. The Originators of Puritan Silver Paste, Otto A. Both Corp., 50 Hartford st., Boston, Mass.—Adv.

Industrial
FINISHING

Distributed to Executives and Foremen Finishers in industrial plants where finishing coats are applied with finishing equipment

Published the 18th of each month by
PRACTICAL PUBLICATIONS, Inc.
222 East Ohio St., Indianapolis, Ind.
Telephone ..... Riley 6771

•

President.....A. T. Gaumer
Vice-Pres. and Editor.....W. H. Rohr
Treasurer and Adv. Mgr.....E. A. Dosch
Secretary.....R. E. Suits

•

Subscription Rates Per Year
U. S. and Possessions.....$2.00
Canada and Foreign Countries.....$3.00

# EDITORIAL

## Quality Goods Again Demanded

Cheap materials, supplies and equipment—makeshifts which "will serve the purpose a little while because we anticipate everything going to the bow-wows soon"—have had their fling and now, with confidence in the present and future restored, individuals and companies are looking for something of better quality when they buy, and they expect to pay more for it. Manufacturers in all lines will do well to take note of this trend which is becoming quite general. Among other things, better and more attractive finishes are in demand, and today they are available in a greater number and variety than ever before.

Many of the latest finishing materials developed for industrial uses are briefly described in a feature article elsewhere in this issue. Investigate those that are, or may be, adaptable to your line of work. The more complete information revealing their merits, uses and prices may surprise you. Remember, your customers will not be so eagerly searching for better quality goods if you are quick to anticipate their needs and give them something equally as good or better than is being offered elsewhere.

## Business Increases; Prospects

End of the year business statements of the majority of firms and individuals showed actual increases in business of 5% to 100% or more for 1935 as compared to 1934, and considerable optimism prevails about 1936, not withstanding the present political aspects of the 366-day period. All indications point to a very busy year. People in general anticipate it, and business concerns are preparing for it. Unbounded confidence and eagerness to get ahead prevail almost everywhere.

Great numbers of better products and improvements have been made during the past several years and as individual and company incomes mount, more and more people will find it possible to acquire some of the things they have been wanting. Needs have a way of multiplying when incomes increase. Firms with improved products and services, who

tell their trade about what they are offering, will do a good volume of business in 1936. Conservative estimates forecast 10% better business in general for 1936 as compared to 1935. This will mean 20%, 50% and even 100% increases for some of the aggressive leaders who must bring up the average for those that are just breaking even, and others that are losing out.

## What's Selling in New York

*From one of our New York City correspondents comes the following:*

It has been reported from local store offices that 1936 Furniture Promotions will substitute the Word "Contemporary" for "Modern," in describing furniture developed from current designs. It is felt, in many quarters, that "Modern" has been too closely associated with furniture lacking in artistic merit and human appeal. The term "contemporary" has been favored by the Metropolitan Museum of Art, New York City, since the start of the modernistic movement.

One of the most poular items in the New York City market at present is the tilt-top table — a bridge-luncheon or game table which can be set on edge or tilted to serve as a fireplace screen, or a screen for other purposes, or as a decorative object. The tops of these tables are decorated in various ways—in floral, landscape and other designs, and in a wide variety of colors, as well as in ivory, black, or maple finish.

A new and useful item shown during the holidays, also serves two or more purposes. (This multiple idea in furniture is exceedingly popular in the Eastern market.) It is a toy chest about 14½ x27½x13-in. It provides a storage place for children's toys, and also serves as a window seat in the child's room. It is firmly built of strong wood framing and is covered solid, having a mother-of-pearl finish or a satinwood finish, in colors of blue, green and maize, and is lined with an eggshell finish. The top is of 3-ply furniture wood, with lacquered sides and handles.

A new color is seen in kitchen cutlery — canary color, with one blue and one white narrow stripe (also red or green stripes) near the top of the handles.

Toys appear in red, blue or green trimmed with yellow or white. A popular combination of colors for many decorative features this season consists of medium dark blue and silver.

Seven colors seen largely in Oriental rugs have been called the "perfect seven colors." They are: indigo, porcelain blue, green, yellow, orange, crimson, and rose-red.

## Flexible Finishes

Continual development and improvement in finishing materials have resulted in making available something many concerns have wanted a long time, namely, really flexible finishes. Durable and attractive coatings are now on the market for use on paper, leather, soft rubber, fabrics, flexible metal such as collapsible tubes, and even for foliage. Besides their excellent flexibility qualities, these materials have good adhesion to the surfaces to which they are applied. They can be put on by spraying, dipping

or roller coating, the latter process having become quite popular for coating sheet stock on a production basis; it gives a uniformly thin, smooth coating.

Then there are webbing or bridging lacquers which form thin "soap bubble" films which can be used so effectively to span slender wire frames formed into the shape of leaves, flower petals, etc.

## What Modern Art Is

That indefinite term "Modern Art" was defined recently by one of New York's most famous architects, Henry Wiley Corbett, as follows: "Modern art is just an effort to tell the simple truth with materials, in contrast with the old-fashioned idea of using materials to conceal the truth." Enlarging further on this point, he added: "If any beauty is to come into the life of the masses of the people it must come through machine-made articles. The average person can never hope to own major works of the great masters." Mr. Corbett expects to see further improvement in the design of average household articles, and calls attention to the value of combining the esthetic with the utilitarian.

## Letters from I. F. Readers

*(Continued from page 7)*

ble for textiles, leather, wood and paper. Our customer tells us that this process is used extensively on sewing machines, adding machines, typewriters, filing cases . . . . furnace castings, etc. Any information you can supply, which we, in turn, may pass on to our customer, will be appreciated.—B. F. E. Co. (Electric Devices).

## Pastel Color Stains

Will you kindly let us have a list of manufacturers of water or oil stains suitable for dipping of low-priced wood products? We are enclosing a sample of what we would like to duplicate. These are especially desired in light pastel colors, such as orchid, light green, light blue and pink.—H. Bros. (Fiber Products).

## Copper Coating

A recent issue of INDUSTRIAL FINISHING contained an article on copper coating, and if possible we would appreciate a copy of it.—H. S. G. & M. Glass Co. (Glass Products).

EDITOR'S NOTE: Probably the article in question is the one entitled "Copper Paint Developed," which appeared in March 1935 issue, pages 42, 43 and 44.

## Silk Screen Book

We have been referred to you by the E. I. duPont deNemours & Co., as a possible source for suggesting practical books on the silk screen stencil process of sign production. If you can furnish us with the names of books with practical instructions for both the making and using of silk screens, we will appreciate receiving same.—G. N. S. Co. (Wire Specialties).

EDITOR'S NOTE: INDUSTRIAL FINISHING has an excellent book entitled "Silk Screen Methods of Reproduction," price $3.00, see ad on page 43 of November, 1935, issue.

## To Polish Fancy Hardwood Turnings

We are primarily turners of various hardwoods such as lignum-vitae, cocobolo, rosewood, ebony, etc. Among the products we manufacture are such items as handles and knobs, gavels and round sound blocks, balls, muddlers, whiskey-bottle stoppers, etc.

In order to bring out the natural and beautiful characteristics of these foreign hardwoods, it is necessary to give them a high French polish; in other words, a rubbed finish. At the present time, every French-polished piece that goes out of our plant is hand-rubbed while the object is rotating in a lathe.

We are now giving serious consid-

eration to developing various markets for our fancy hardwood products, and one of the problems in this connection is that of working out a way of finishing which will enable us to secure our usual high quality, as well as greatly increased production. We are wondering whether you have any data in this connection, or can put us in touch with concerns who produce automatic equipment for polishing round, spherical, and cylindrical objects. We know from various issues of your magazine that there are automatic devices for polishing furniture and the like, but we do not know whether such equipment would be adaptable for the purpose we have in mind. We will welcome your cooperation in this connection.—L. W. T. Co.

## Wants Good Sealer

Our product consists of a novelty line of myrtlewood bowls, lamps, trays, candlesticks and special furniture pieces, all made from the myrtlewood which is a hardwood found only in this western country (Oregon) and the Holy Lands. The finish must be perfect. We use a spray gun, using a sealer and lacquer, and we have had some trouble with small bubbles appearing on the surface after coating. This does not happen on every article but on many of them. What is your idea of the cause and cure? A finishing material which will spray on this wood without bubbles in the sealer and in the lacquer would give us a better finish and also lower our costs of finishing. We would be interested in any material from any manufacturer which will solve this problem for us. —E. R. G.

## Webbing Lacquer

In the January 1935 issue of INDUSTRIAL FINISHING, on page 48, in the second paragraph of your article entitled, "Fish Skin Flowers," you mention a webbing or bridging lacquer. Could you advise us from whom we can procure working samples of this lacquer?—V. & C. Co. (Makers of Mesh Bags).

## Bakelite-Base Finish

We are interested in finishing cold-rolled steel plates with a lacquer or varnish in a dull black that has a Bakelite base, and which is resistant to chemical action. Will you kindly furnish us with the names of concerns who are in a position to supply same?—M. E. T. Co. (Testing Instruments).

## Wants Kemick

In reading November INDUSTRIAL FINISHING magazine, I notice, on page 38, mention of "Kemick," a black chemical paint that can be used on surfaces which are subjected to great heat, etc. Please send me the name and address of the manufacturer that makes and sells this material, as I have use for it. . . . —A. E. L.

## Fireproofing Wood

In the September 1935 issue of INDUSTRIAL FINISHING, page 55, there is a reference to fireproofing wood. Will you please supply me with the names of the manufacturers of such coatings, as indicated in the last paragraph of the article? In addition, I would appreciate any other information that you would care to give me on this subject.—A. I. C. Laboratories.

## Iron Casting Finish

Can you refer us to some manufacturer of coating materials who could recommend and supply us with a quick-drying enamel or lacquer for coating intricate iron castings? By this we mean, small castings that have numerous projections and fins, which make it difficult and expensive to sand out the "high spots." Someone must be producing a material with a comparatively heavy body that will flow out and still have the utmost covering or hiding capacity.—H. Mfg. Co. (Pumps, Compressors, etc.).

## Line Production in Finishing Furniture

In reading October issue of the INDUSTRIAL FINISHING, I was interested particularly in Mr. Herman Erickson's article entitled "Line Production Applied to Furniture Finishing," beginning on page 12. I have been with a California furniture company for the past 10 years, and for the last four years I have had line production in my finishing room. I pride myself on having a real system which is very much needed in

the finishing of furniture, especially in this day when we must get production to compete with other live-wire companies.

I employ every man that comes along who has had any experience at all as a foreman finisher, and they all look in amazement when they see with what ease I move the product through our finishing department.

According to Mr. Erickson, in the first place they have to stain their merchandise and then let it set ten minutes before filling. I have that beat in many ways. I use a special permanent stain to uniform the woods perfectly, and I do not have to take the piece of furniture off the turntable. I have my stain in a container on one side of the booth, and the filler on the other side of the booth, so that for staining and filling we require but one handling, which is quite a saving. Also, it requires no heat for drying; and the stain makes the wood smoother than it was before. It will uniform gum, redwood, pine, and all of those woods wherein, as any finisher knows, the real expense in finishing is shading the parts after filling.

Anyone who sees the merchandise I turn out agrees that it has a good finish. Our company is selling furniture in every state in the U. S. A., and plenty of it.

Mr. Erickson refers to time for foremen. I get out from two to four new finishes per month. I love to create new finishes.

Well, back to the straight line method of finishing. After filling and drying, spray on a coat of sealer; then sand smoothly. Touch up a few spots with shading stain, if and where needed. The second coat is sprayed on, after which the work goes into the dry room for a drying period of from two to three hours; then to the rubbing room, where I have all of them backed off the map, as I use a special polish which rubs and polishes at the same time, saving one operation.

Just look at some of our merchandise in your own town of Indianapolis, Mr. EDITOR. . . .—C. J. Cole.

## Tumbling Process

Recently we have had a considerable amount of work coming through our finishing room which could have been finished by a tumbling system. At present all of our work is done by spraying, and we are desirous of reducing this cost on the cheaper items. Would you, therefore, please advise us where we can secure complete details on a tumbling system, type of material used, and equipment necessary? Also, please advise where we will find the same information on the squeegee process.—U. F. W. Co. (Wood Products).

## Wood Heel Finish

We are experimenting with a plywood composition made of birch and maple to be used for wood heels, and we are having difficulty in getting a transparent finish which will show up the various colors of the wood, and at the same time give us the effect of a genuine leather heel. . . . Will you please let us know what, in your opinion, would be the best way to produce this result, and give us an outline in detail as to the method to be followed?—E. V. G. Co. (Wood Heels).

## More Rapid Bleaching

We note in the October and November issues of INDUSTRIAL FINISHING (pages 49 and 51) references to a wood bleaching process. We would appreciate being put in touch with the people concerned, for it is possible that by the use of our Centrifugal Impregnator and a good bleaching solution, we can bleach wood more quickly and uniformly than by any other method. — The Leon J. Barrett Co. (Centrifugal Machinery).

## Metal Cleaning

We note from a recent number of INDUSTRIAL FINISHING that you are distributing an illustrated book from the press of E. F. Houghton & Co. on "Metal Cleaning" (August, 1935, page 36). We should be pleased to receive a copy of this book, which we would ask you to send marked for the attention of the undersigned. —A. Sellman, Works Chemist, Electrolux, Ltd., 153 Regent St., W. 1, London, ENGLAND.

EDITOR'S NOTE: Another excellent book on this subject has been recently published by the Magnus Chemical Co., 49 South Ave., Garwood, N. J. (See October issue, page 59.)

## Lacquer Brush-Fibers

The article entitled, "Why and How Hats Are Lacquer Sized," page 26, December issue, by Ray C. Mar-

tin, makes us wonder if the sizing of fiber for brushes might not find a solution in this same principle Martin solved the hat problem with? Our object is to stiffen the fiber so it will brush more effectively. Here attached is sample of same. Could you help us? — L. I. Co. ("Packets of Tidiness").

## Berry Brothers Personnel

A letter from Berry Brothers, Detroit, Mich., states that:

"Mr. H. C. Williams, formerly our Philadelphia Manager, is now district manager of our Baltimore-Washington territory, effective January 1, 1936."

## Plaskon Co., Inc., New Name of Toledo Synthetic Products

Toledo Synthetic Products, Inc., makers of Plaskon, colorful urea molding material, announces a change in name effective January 1, 1936. The new name of the company is Plaskon Company, Inc.

## Air Compressors

The Wright Mfg. Division of American Chain Co., Inc., York, Pa., announces a complete line of air compressors. These will be distributed exclusively through the industrial and mill supply accounts. The Wright Compressor line will include both single and double stage units in the permanent and portable styles. A complete catalog will be sent on request.

# Classified Advertising

### VARNISH SALESMAN

With established industrial and trade accounts wanted. Write THE THIBAUT & WALKER CO., 5-48-46th Road, Long Island City, N. Y.

### AN EXPERIENCED SALESMAN

Wanted by a well-established Eastern manufacturer of lacquers and synthetic enamels to fill vacancy in Philadelphia territory. Excellent opportunity to right man. Salary and commission. Address IF-593, care Industrial Finishing.

### POSITION WANTED

Paint Chemist desires new position. Seven years' experience in production, supervising and research. Six years one company. Familiar with architectural and industrial finishes, pigmented stains, etc. Single, 30 years of age. Will go anywhere sufficient opportunity is presented. Available immediately. Address IF-595, care Industrial Finishing.

### BROKERAGE CONNECTION

Twenty-year Partner Sales-Manager, large industrial paint concern desires brokerage-sales connection, Enamel, Undercoat, Lacquer, general industrial finishes. State your proposition to man of excellent record, acknowledged Enamel authority industrial field. Coast to coast customers. Address IF-594, care Industrial Finishing.

### SALESMEN WANTED

We require the services of two experienced Paint, Varnish and Lacquer Salesmen, one for New York state, the other for the state of Indiana. Our line is complete and we cater to a strictly high-grade clientele. We specialize on industrial trade only. Applicants must have a clean and successful selling record. Address IF-589, care Industrial Finishing.

### SALESMAN WANTED

Opportunity for the right man to take over Michigan and Wisconsin territory for a leading wood finishing material manufacturer, located in Middle West. Man must be experienced in this line. Address IF-592, care Industrial Finishing.

### THE ALEXANDER MILBURN CO.

Paint Spray Equipment, Standardized Cutting and Welding Apparatus and Portable Carbide Lamps. Write for Catalog.
1402 W. Baltimore st.,
Baltimore, Md.

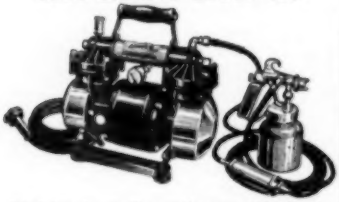
### PAINT SALESMAN

SELL DIRECT to auto paint shops, auto dealers, fleet owners full line quality lacquers, undercoaters, synthetic enamels. $100 to $300 required for stock from which to sell and deliver. Big commissions and profits for salesmen following our approved plan. Give complete record and 3 references. Selling experience not essential. Our plan brings success. Do not answer if you cannot buy own stock. Address MANUFACTURERS, 5060 Edwin ave., Detroit, Mich.

# CROWN AIRFLO

*Portable Spray Painting Unit*

**OPERATES WITHOUT OIL**
**CUTS UPKEEP COSTS 50%**



Ideal for the small manufacturer. No Crankcase—no oil-laden air. Operates with oil-less bearings guaranteed 25 years. Delivers more pressure—more volume per motor horsepower. Fewest moving parts. G-E motor, blower-cooled. Extremely portable. ⅓, 1/3 and ½ H.P. Priced from $74.50. Write for full details.

**CROWN SPRAY GUN MFG. CO.**
1218 Venice Blvd. Los Angeles, Calif.
*Warehouses in Principal Cities*

# GET THIS BOOK!

COLOR Formulas and Useful Color Cards. Description, Properties, Theory, Harmony and Management of Colors. Color Use and the Mixing of Colors and Paints for Interior Decorating, House Painting, Arts and Crafts, Furniture and Polychrome Finishing. Color and Light; Description of Color Pigments; Properties of Color Pigments; How Colors Are Prepared for the Trade; Basic Paint Pigments; Painting Oils; Volatile Thinners and Dryers; General Paint Mixing Methods; Color Theory, Principles and Use; Colored Paint Mixing Methods; Mixing Special Purpose Materials; Color Harmony and Management; Selecting Color Schemes; Printing Inks.

*296 Pages, Fully Illustrated with Color Chart and Drawings,* Cloth. Price..... **$2.00**

**Practical Publications, Inc.**
222 E. Ohio St. Indianapolis, Ind.


# Index to Advertisers


Advance Paint Co.....Third Cover
Arco Company, The.....51
Atlas Powder Co.....2
Ault & Wiborg Corp.....Back Cover

Barrett Co., The Leon J.....49
Behlen & Bro., H.....6
Berry Brothers.....33
Binks Manufacturing Co.....1
Both Corp., Otto A.....61

Classified Advertising.....67
Commercial Solvents Corp.....41
Crown Spray Gun Mfg. Co.....68

Day & Co., James B.....43
DeVilbiss Co., The.....8
Dewey Co., Henry A.....28
Dolan & Co., V. J.....49
duPont DeNemours & Co., E. I.....34-35

Egyptian Lacquer Mfg. Co.....36
Glidden Co., The.....17

Hilo Varnish Corp.....5
Hommel Co., Inc., The O.....58

Impervious Varnish Co.....60

Larkin Co., Inc.....55
Lilly Varnish Co.....Front Cover

Maas & Waldstein Co.....39
Magnus Chemical Co.....59
Milburn Co., Alex.....67
Mine Safety Appliance Co.....

Paasche Airbrush Co.....57

Revolite Corp., The.....6
Rockford Varnish Co.....45
Ross Engineering Corp., J. O.....59
Roxalin Flexible Lacquer Co.....Second Cover

Sherwin-Williams Co.....31
Stanley Chemical Co.....47
Stapled Fibres Corp.....30
Stille-Young Corp.....
Sun Oil Co.....60

U. S. Bronze Powder Wks.....28

Van Allen & Co., L. R.....60
Varnish Products Co.....55

Walker Co., H. V.....7

Zapon-Brevolite Lacquer Co.....2
Zapon Co., The.....2